



CFA Institute®
CFA Program

ALTERNATIVE INVESTMENT, PORTFOLIO MANAGEMENT, AND PRIVATE WEALTH MANAGEMENT

CFA® Program Curriculum
2020 • LEVEL III • VOLUME 5

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How to Use the CFA Program Curriculum

Congratulations on reaching Level III of the Chartered Financial Analyst® (CFA®) Program. This exciting and rewarding program of study reflects your desire to become a serious investment professional. You have embarked on a program noted for its high ethical standards and the breadth of knowledge, skills, and abilities (competencies) it develops. Your commitment to the CFA Program should be educationally and professionally rewarding.

The credential you seek is respected around the world as a mark of accomplishment and dedication. Each level of the program represents a distinct achievement in professional development. Successful completion of the program is rewarded with membership in a prestigious global community of investment professionals. CFA charterholders are dedicated to life-long learning and maintaining currency with the ever-changing dynamics of a challenging profession. The CFA Program represents the first step toward a career-long commitment to professional education.

The CFA examination measures your mastery of the core knowledge, skills, and abilities required to succeed as an investment professional. These core competencies are the basis for the Candidate Body of Knowledge (CBOK™). The CBOK consists of four components:

- A broad outline that lists the major topic areas covered in the CFA Program (<https://www.cfainstitute.org/programs/cfa/curriculum/cbok>);
- Topic area weights that indicate the relative exam weightings of the top-level topic areas (<https://www.cfainstitute.org/programs/cfa/curriculum/overview>);
- Learning outcome statements (LOS) that advise candidates about the specific knowledge, skills, and abilities they should acquire from readings covering a topic area (LOS are provided in candidate study sessions and at the beginning of each reading); and
- The CFA Program curriculum that candidates receive upon examination registration.

Therefore, the key to your success on the CFA examinations is studying and understanding the CBOK. The following sections provide background on the CBOK, the organization of the curriculum, features of the curriculum, and tips for designing an effective personal study program.

BACKGROUND ON THE CBOK

The CFA Program is grounded in the practice of the investment profession. Beginning with the Global Body of Investment Knowledge (GBIK), CFA Institute performs a continuous practice analysis with investment professionals around the world to determine the competencies that are relevant to the profession. Regional expert panels and targeted surveys are conducted annually to verify and reinforce the continuous feedback about the GBIK. The practice analysis process ultimately defines the CBOK. The

CBOK reflects the competencies that are generally accepted and applied by investment professionals. These competencies are used in practice in a generalist context and are expected to be demonstrated by a recently qualified CFA charterholder.

The CFA Institute staff, in conjunction with the Education Advisory Committee and Curriculum Level Advisors, who consist of practicing CFA charterholders, designs the CFA Program curriculum in order to deliver the CBOK to candidates. The examinations, also written by CFA charterholders, are designed to allow you to demonstrate your mastery of the CBOK as set forth in the CFA Program curriculum. As you structure your personal study program, you should emphasize mastery of the CBOK and the practical applications of that knowledge. For more information on the practice analysis, CBOK, and development of the CFA Program curriculum, please visit www.cfainstitute.org.

ORGANIZATION OF THE CURRICULUM

The Level III CFA Program curriculum is organized into seven topic areas. Each topic area begins with a brief statement of the material and the depth of knowledge expected. It is then divided into one or more study sessions. These study sessions—16 sessions in the Level III curriculum—should form the basic structure of your reading and preparation. Each study session includes a statement of its structure and objective and is further divided into assigned readings. An outline illustrating the organization of these 16 study sessions can be found at the front of each volume of the curriculum.

The readings are commissioned by CFA Institute and written by content experts, including investment professionals and university professors. Each reading includes LOS and the core material to be studied, often a combination of text, exhibits, and in-text examples and questions. A reading typically ends with practice problems followed by solutions to these problems to help you understand and master the material. The LOS indicate what you should be able to accomplish after studying the material. The LOS, the core material, and the practice problems are dependent on each other, with the core material and the practice problems providing context for understanding the scope of the LOS and enabling you to apply a principle or concept in a variety of scenarios.

The entire readings, including the practice problems at the end of the readings, are the basis for all examination questions and are selected or developed specifically to teach the knowledge, skills, and abilities reflected in the CBOK.

You should use the LOS to guide and focus your study because each examination question is based on one or more LOS and the core material and practice problems associated with the LOS. As a candidate, you are responsible for the entirety of the required material in a study session.

We encourage you to review the information about the LOS on our website (www.cfainstitute.org/programs/cfa/curriculum/study-sessions), including the descriptions of LOS “command words” on the candidate resources page at www.cfainstitute.org.

FEATURES OF THE CURRICULUM

Required vs. Optional Segments You should read all of an assigned reading. In some cases, though, we have reprinted an entire publication and marked certain parts of the reading as “optional.” The CFA examination is based only on the required segments, and the optional segments are included only when it is determined that they might

help you to better understand the required segments (by seeing the required material in its full context). When an optional segment begins, you will see an icon and a dashed vertical bar in the outside margin that will continue until the optional segment ends, accompanied by another icon. *Unless the material is specifically marked as optional, you should assume it is required.* You should rely on the required segments and the reading-specific LOS in preparing for the examination.

END OPTIONAL
SEGMENT

Practice Problems/Solutions *All practice problems at the end of the readings as well as their solutions are part of the curriculum and are required material for the examination.* In addition to the in-text examples and questions, these practice problems should help demonstrate practical applications and reinforce your understanding of the concepts presented. Some of these practice problems are adapted from past CFA examinations and/or may serve as a basis for examination questions.


Glossary For your convenience, each volume includes a comprehensive glossary. Throughout the curriculum, a **bolded** word in a reading denotes a term defined in the glossary.

Note that the digital curriculum that is included in your examination registration fee is searchable for key words, including glossary terms.

LOS Self-Check We have inserted checkboxes next to each LOS that you can use to track your progress in mastering the concepts in each reading.

Source Material The CFA Institute curriculum cites textbooks, journal articles, and other publications that provide additional context and information about topics covered in the readings. As a candidate, you are not responsible for familiarity with the original source materials cited in the curriculum.

Note that some readings may contain a web address or URL. The referenced sites were live at the time the reading was written or updated but may have been deactivated since then.



Some readings in the curriculum cite articles published in the *Financial Analysts Journal*®, which is the flagship publication of CFA Institute. Since its launch in 1945, the *Financial Analysts Journal* has established itself as the leading practitioner-oriented journal in the investment management community. Over the years, it has advanced the knowledge and understanding of the practice of investment management through the publication of peer-reviewed practitioner-relevant research from leading academics and practitioners. It has also featured thought-provoking opinion pieces that advance the common level of discourse within the investment management profession. Some of the most influential research in the area of investment management has appeared in the pages of the *Financial Analysts Journal*, and several Nobel laureates have contributed articles.

Candidates are not responsible for familiarity with *Financial Analysts Journal* articles that are cited in the curriculum. But, as your time and studies allow, we strongly encourage you to begin supplementing your understanding of key investment management issues by reading this practice-oriented publication. Candidates have full online access to the *Financial Analysts Journal* and associated resources. All you need is to log in on www.cfapubs.org using your candidate credentials.

Errata The curriculum development process is rigorous and includes multiple rounds of reviews by content experts. Despite our efforts to produce a curriculum that is free of errors, there are times when we must make corrections. Curriculum errata are periodically updated and posted on the candidate resources page at www.cfainstitute.org.

DESIGNING YOUR PERSONAL STUDY PROGRAM

Create a Schedule An orderly, systematic approach to examination preparation is critical. You should dedicate a consistent block of time every week to reading and studying. Complete all assigned readings and the associated problems and solutions in each study session. Review the LOS both before and after you study each reading to ensure that you have mastered the applicable content and can demonstrate the knowledge, skills, and abilities described by the LOS and the assigned reading. Use the LOS self-check to track your progress and highlight areas of weakness for later review.

Successful candidates report an average of more than 300 hours preparing for each examination. Your preparation time will vary based on your prior education and experience, and you will probably spend more time on some study sessions than on others. As the Level III curriculum includes 16 study sessions, a good plan is to devote 15–20 hours per week for 16 weeks to studying the material, and use the final four to six weeks before the examination to review what you have learned and practice with practice questions and mock examinations. This recommendation, however, may underestimate the hours needed for appropriate examination preparation depending on your individual circumstances, relevant experience, and academic background. You will undoubtedly adjust your study time to conform to your own strengths and weaknesses and to your educational and professional background.

You should allow ample time for both in-depth study of all topic areas and additional concentration on those topic areas for which you feel the least prepared.

As part of the supplemental study tools that are included in your examination registration fee, you have access to a study planner to help you plan your study time. The study planner calculates your study progress and pace based on the time remaining until examination. For more information on the study planner and other supplemental study tools, please visit www.cfainstitute.org.

As you prepare for your exam, we will e-mail you important examination updates, testing policies, and study tips. Be sure to read these carefully.

CFA Institute Practice Questions Your examination registration fee includes digital access to hundreds of practice questions that are additional to the practice problems at the end of the readings. These practice questions are intended to help you assess your mastery of individual topic areas as you progress through your studies. After each practice question, you will be able to receive immediate feedback noting the correct responses and indicating the relevant assigned reading so you can identify areas of weakness for further study. For more information on the practice question sets, please visit www.cfainstitute.org.

CFA Institute Mock Examinations Your examination registration fee also includes digital access to three-hour mock examinations that simulate the morning and afternoon sessions of the actual CFA examination. These mock examinations are intended to be taken after you complete your study of the full curriculum and take practice questions so you can test your understanding of the curriculum and your readiness for the examination. You will receive feedback at the end of the mock examination, noting the correct responses and indicating the relevant assigned readings so you can assess areas of weakness for further study during your review period. We recommend that you take mock examinations during the final stages of your preparation for the actual CFA examination. For more information on the mock examinations, please visit www.cfainstitute.org.

Preparatory Providers After you enroll in the CFA Program, you may receive numerous solicitations for preparatory courses and review materials. When considering a prep course, make sure the provider belongs to the CFA Institute Approved Prep Provider Program. Approved Prep Providers have committed to follow CFA Institute guidelines and high standards in their offerings and communications with candidates. For more information on the Approved Prep Providers, please visit www.cfainstitute.org/programs/cfa/exam/prep-providers).

Remember, however, that there are no shortcuts to success on the CFA examinations; reading and studying the CFA curriculum *is* the key to success on the examination. The CFA examinations reference only the CFA Institute assigned curriculum—no preparatory course or review course materials are consulted or referenced.

SUMMARY

Every question on the CFA examination is based on the content contained in the required readings and on one or more LOS. Frequently, an examination question is based on a specific example highlighted within a reading or on a specific practice problem and its solution. To make effective use of the CFA Program curriculum, please remember these key points:

- 1 All pages of the curriculum are required reading for the examination except for occasional sections marked as optional. You may read optional pages as background, but you will not be tested on them.
- 2 All questions, problems, and their solutions—found at the end of readings—are part of the curriculum and are required study material for the examination.
- 3 You should make appropriate use of the practice questions and mock examinations as well as other supplemental study tools and candidate resources available at www.cfainstitute.org.
- 4 Create a schedule and commit sufficient study time to cover the 16 study sessions, using the study planner. You should also plan to review the materials and take practice questions and mock examinations.
- 5 Some of the concepts in the study sessions may be superseded by updated rulings and/or pronouncements issued after a reading was published. Candidates are expected to be familiar with the overall analytical framework contained in the assigned readings. Candidates are not responsible for changes that occur after the material was written.

FEEDBACK

At CFA Institute, we are committed to delivering a comprehensive and rigorous curriculum for the development of competent, ethically grounded investment professionals. We rely on candidate and investment professional comments and feedback as we work to improve the curriculum, supplemental study tools, and candidate resources.

Please send any comments or feedback to info@cfainstitute.org. You can be assured that we will review your suggestions carefully. Ongoing improvements in the curriculum will help you prepare for success on the upcoming examinations and for a lifetime of learning as a serious investment professional.

Portfolio Management

STUDY SESSIONS

Study Session 3	Behavioral Finance
Study Session 4	Capital Market Expectations
Study Session 5	Asset Allocation and Related Decisions in Portfolio Management
Study Session 6	Derivatives and Currency Management
Study Session 7	Fixed-Income Portfolio Management (1)
Study Session 8	Fixed-Income Portfolio Management (2)
Study Session 9	Equity Portfolio Management (1)
Study Session 10	Equity Portfolio Management (2)
Study Session 11	Alternative Investments Portfolio Management
Study Session 12	Private Wealth Management (1)
Study Session 13	Private Wealth Management (2)
Study Session 14	Portfolio Management for Institutional Investors
Study Session 15	Trading, Performance Evaluation, and Manager Selection
Study Session 16	Cases in Portfolio Management and Risk Management

This volume includes Study Sessions 11–13.

TOPIC LEVEL LEARNING OUTCOME

The candidate should be able to prepare an appropriate investment policy statement and asset allocation; formulate strategies for managing, monitoring, and rebalancing investment portfolios; and evaluate portfolio performance.

PORTFOLIO MANAGEMENT STUDY SESSION

11

Alternative Investments for Portfolio Management

Alternative investments comprise groups of investments with risk and return characteristics that differ from those of traditional stock and bond investments. For the purposes of this study session, private equity, hedge funds, real assets (including energy and commodity investments), commercial real estate, and private credit are included as alternative assets.

The first reading presents distinctive regulatory and investment characteristics of the major categories of hedge fund strategies. It also provides a conditional risk factor model as a unifying framework for understanding and analyzing the risk exposures of these strategies.

The second reading discusses the role alternative assets play in a multi-asset portfolio and explores how alternatives may serve to mitigate long-only equity risk. Approaches to asset allocation when incorporating alternatives in the opportunity set—whether through the traditional asset class lens or, more recently, using a risk- or factor-based lens—are examined. The reading concludes with a discussion of the need for liquidity planning in private investment alternatives and the unique monitoring requirements of an alternatives portfolio.

READING ASSIGNMENTS

Reading 26

Hedge Fund Strategies
by Barclay T. Leib, CFE, CAIA, Kathryn M. Kaminski, PhD,
CAIA, and Mila Getmansky Sherman, PhD

Reading 27

Asset Allocation to Alternative Investments
by Adam Kobor, PhD, CFA, and Mark D. Guinney, CFA

READING

26

Hedge Fund Strategies

by Barclay T. Leib, CFE, CAIA, Kathryn M. Kaminski, PhD, CAIA, and Mila Getmansky Sherman, PhD

Barclay T. Leib, CFE, CAIA, is at Sand Spring Advisors LLC (USA). Kathryn M. Kaminski, PhD, CAIA, is at Alpha Simplex Group, LLC (USA). Mila Getmansky Sherman, PhD, is at Isenberg School of Management, UMASS Amherst (USA).

LEARNING OUTCOMES

Mastery	The candidate should be able to:
<input type="checkbox"/>	a. discuss how hedge fund strategies may be classified;
<input type="checkbox"/>	b. discuss investment characteristics, strategy implementation, and role in a portfolio of <i>equity-related</i> hedge fund strategies;
<input type="checkbox"/>	c. discuss investment characteristics, strategy implementation, and role in a portfolio of <i>event-driven</i> hedge fund strategies;
<input type="checkbox"/>	d. discuss investment characteristics, strategy implementation, and role in a portfolio of <i>relative value</i> hedge fund strategies;
<input type="checkbox"/>	e. discuss investment characteristics, strategy implementation, and role in a portfolio of <i>opportunistic</i> hedge fund strategies;
<input type="checkbox"/>	f. discuss investment characteristics, strategy implementation, and role in a portfolio of <i>specialist</i> hedge fund strategies;
<input type="checkbox"/>	g. discuss investment characteristics, strategy implementation, and role in a portfolio of <i>multi-manager</i> hedge fund strategies;
<input type="checkbox"/>	h. describe how factor models may be used to understand hedge fund risk exposures;
<input type="checkbox"/>	i. evaluate the impact of an allocation to a hedge fund strategy in a traditional investment portfolio.

INTRODUCTION

1

Hedge funds form an important subset of the alternative investments opportunity set, but they come with many pros and cons in their use and application across different asset classes and investment approaches. The basic tradeoff is whether the added

fees typically involved with hedge fund investing result in sufficient additional alpha and portfolio diversification benefits to justify the high fee levels. This is an ongoing industry debate.

Some argue that investing in hedge funds is a key way to access the very best investment talent—those individuals who can adroitly navigate investment opportunities across a potentially wider universe of markets. Others argue that hedge funds are important because the alpha that may be produced in down markets is hard to source elsewhere.

The arguments against hedge funds are also non-trivial. In addition to the high fee levels, the complex offering memorandum documentation needs to be understood by investors (i.e., the limited partners). Other issues include lack of full underlying investment transparency/attribution, higher cost allocations associated with the establishment and maintenance of the fund investment structures, and generally longer-lived investment commitment periods with limited redemption availability.

In addition, each hedge fund strategy area tends to introduce different types of added portfolio risks. For example, to achieve meaningful return objectives, arbitrage-oriented hedge fund strategies tend to utilize significant leverage that can be dangerous to limited partner investors, especially during periods of market stress. Long/short equity and event-driven strategies may have less beta exposure than simple, long-only beta allocations, but the higher hedge fund fees effectively result in a particularly expensive form of embedded beta. Such strategies as managed futures or global macro investing may introduce natural benefits of asset class and investment approach diversification, but they come with naturally higher volatility in the return profiles typically delivered. Extreme tail risk in portfolios may be managed with the inclusion of relative value volatility or long volatility strategies, but it comes at the cost of a return drag during more normal market periods. In other words, some hedge fund strategies may have higher portfolio diversification benefits, while others may simply be return enhancers rather than true portfolio diversifiers.

Also, the hedge fund industry continues to evolve in its overall structure. Over the past decade, traditional limited partnership formats have been supplemented by offerings of liquid alternatives (liquid alts)—which are mutual fund, closed-end fund, and ETF-type vehicles that invest in various hedge fund-like strategies. Liquid alts are meant to provide daily liquidity, transparency, and lower fees while opening hedge fund investing to a wider range of investors. However, empirical evidence shows that liquid alts significantly underperform similar strategy hedge funds, which suggests that traditional hedge funds may be benefiting from an illiquidity premium phenomenon that cannot be easily transported into a mutual fund format.

Investors must understand the various subtleties involved with investing in hedge funds. Although secular bull market trends have arguably made “hedged” strategies less critical for inclusion in portfolio allocations than they were during the mid-to-late 2000s, the overall popularity of hedge funds tends to be somewhat cyclical. Notably, as demonstrated by the endowment model of investing, placing hedge funds as a core allocation can increase net returns and reduce risk.

This reading presents the investment characteristics and implementation for the major categories of hedge fund strategies. It also provides a framework for classifying and evaluating these strategies based on their risk profiles. Section 2 summarizes some distinctive regulatory and investment characteristics of hedge funds and discusses ways to classify hedge fund strategies. Sections 3 through 8 present investment characteristics and strategy implementation for each of the following six hedge fund strategy categories: equity-related; event-driven; relative value; opportunistic; specialist; and multi-manager strategies. Section 9 introduces a conditional factor model as a unifying framework for understanding and analyzing the risk exposures of these

strategies. Section 10 evaluates the contributions of each hedge fund strategy to the return and risk profile of a traditional portfolio of stocks and bonds. The reading concludes with a summary.

CLASSIFICATION OF HEDGE FUNDS AND STRATEGIES

2

The most important characteristics of hedge funds are summarized as follows:

- 1 Legal/Regulatory Overview:** Different countries have varying requirements for investor eligibility to access hedge fund investments. These regulations are typically intended to limit access to traditional hedge funds to sophisticated investors with a minimum income or net-worth requirement, and they allow hedge fund managers to accept only a limited number of investment subscriptions. Most traditional hedge funds in the United States are offered effectively as private placement offerings. Whether the underlying fund manager must register with regulatory authorities depends on assets under management (AUM); however, regardless of AUM, all US hedge funds are subject to regulatory oversight against fraudulent conduct. Hedge funds offered in other jurisdictions—attractive, tax-neutral locales like the Cayman Islands, the British Virgin Islands, or Bermuda—are typically presented to investors as stand-alone corporate entities subject to the rules and regulations of the particular locality.

From a regulatory perspective, the advent of liquid alts has likely caused the greatest shift in the industry over the past decade. Some of the more liquid hedge fund strategies that meet certain liquidity and diversification requirements (generally long/short equity and managed futures strategies) are offered by many fund sponsors in mutual fund-type structures in the United States and in the undertakings for collective investment in transferable securities (UCITs) format in Europe and Asia. By law, these liquid alts vehicles can be more widely marketed to retail investors. Whereas traditional hedge funds typically offer only limited periodic liquidity, liquid alts funds may be redeemed by investors on a daily basis. Also, traditional hedge funds typically involve both a management fee and an incentive fee; however, liquid alts in most countries are prohibited from charging an incentive fee.

Finally, the overall regulatory constraints for hedge funds are far less than those for regulated investment vehicles—except for the liquid alts versions, which have much higher constraints to provide liquidity to investors.

- 2 Flexible Mandates—Few Investment Constraints:** Given the relatively low legal and regulatory constraints faced by hedge funds, their mandates are flexible; thus, they are relatively unhindered in their trading and investment activities in terms of investable asset classes and securities, risk exposures, and collateral. The fund prospectus (i.e., offering memorandum) will specify the hedge fund's mandate and objectives and will include constraints, if any, on investment in certain asset classes as well as in the use of leverage, shorting, and derivatives.
- 3 Large Investment Universe:** Lower regulatory constraints and flexible mandates give hedge funds access to a wide range of assets outside the normal set of traditional investments. Examples include private securities, non-investment-grade debt, distressed securities, derivatives, and more-esoteric contracts, such as life insurance contracts and even music or film royalties.

- 4 **Aggressive Investment Styles:** Hedge funds may use their typically flexible investment mandates to undertake strategies deemed too risky for traditional investment funds. These strategies may involve significant shorting and/or concentrated positions in domestic and foreign securities that offer exposure to credit, volatility, and liquidity risk premiums.
- 5 **Relatively Liberal Use of Leverage:** Hedge funds generally use leverage more extensively than regulated investment funds. Their leveraged positions are implemented either by borrowing securities from a prime broker or by using implied leverage via derivatives. In many instances, such leverage is necessary to make the return profile of the strategy meaningful. In other instances, derivatives may be used to hedge away unwanted risks (e.g., interest rate or credit risk) that may create high “notional leverage” but result in a less risky portfolio. Within long/short equity trading, leverage is most often applied to quantitative approaches in which small statistical valuation aberrations—typically over short windows of time—are identified by a manager or an algorithm. Such quant managers will typically endeavor to be market neutral but will apply high leverage levels to make the opportunities they identify meaningful from a return perspective.
- 6 **Hedge Fund Liquidity Constraints:** Limited partnership-format hedge funds involve initial lock-up periods, liquidity gates, and exit windows. These provide hedge fund managers with a greater ability to take and maintain positions than vehicles that allow investors to withdraw their investment essentially at will. It is thus not surprising that empirical evidence shows that such privately-placed hedge funds significantly outperform similar-strategy liquid alts products by approximately 100 bps–200 bps, on average, per year.
- 7 **Relatively High Fee Structures:** Hedge funds have traditionally imposed relatively high investment fees on investors, including both management fees and incentive fees. These have historically been 1% or more of AUM for management fees and 10%–20% of annual returns for incentive fees. The incentive fee structure is meant to align the interests of the hedge fund manager with those of the fund’s investors.

With this background, we now address how hedge funds are classified. One distinction is between single manager hedge funds and multi-manager hedge funds. A **single-manager fund** is a fund in which one portfolio manager or team of portfolio managers invests in one strategy or style. A **multi-manager fund** can be of two types. One type is a **multi-strategy fund**, in which teams of portfolio managers trade and invest in multiple different strategies within the same fund. The second type, a fund-of-hedge funds, often simply called a **fund-of-funds** (FoF), is a fund in which the fund-of-funds manager allocates capital to separate, underlying hedge funds (e.g., single manager and/or multi-manager funds) that themselves run a range of different strategies.

At the single manager and single strategy level, hedge fund strategies can be classified in various ways. The taxonomy is often based on some combination of:

- 1 the instruments in which the managers invest (e.g., equities, commodities, foreign exchange, convertible bonds);
- 2 the trading philosophy followed by the managers (e.g., systematic, discretionary); and
- 3 the types of risk the managers assume (e.g., directional, event driven, relative value).

Most prominent hedge fund data vendors use a combination of these criteria to classify hedge fund strategies. For example, Hedge Fund Research, Inc. (HFR) reports manager performance statistics on more than 30 strategies and divides funds into six single strategy groupings that are widely used in the hedge fund industry. HFR's six main single strategy groupings are 1) equity hedge; 2) event driven; 3) fund-of-funds; 4) macro; 5) relative value; and 6) risk parity.

Lipper TASS, another well-known data vendor, classifies funds into the following ten categories: 1) dedicated short bias; 2) equity market neutral; 3) long/short equity hedge; 4) event driven; 5) convertible arbitrage; 6) fixed-income arbitrage; 7) global macro; 8) managed futures; 9) fund-of-funds; and 10) multi-strategy.

Morningstar CISDM goes even further and separates hedge funds in its database into finer categories, like merger arbitrage and systematic futures, among others. In addition, the Morningstar CISDM Database separates fund-of-funds strategies into several different sub-categories, such as debt, equity, event driven, macro/systematic, multi-strategy, and relative value.

Eurekahedge, an important index provider with its roots in Asia, has grown to include many smaller hedge fund managers globally. Its main strategy indexes include nine categories: 1) arbitrage; 2) commodity trading adviser (CTA)/managed futures; 3) distressed debt; 4) event driven; 5) fixed income; 6) long/short equities; 7) macro; 8) multi-strategy; and 9) relative value.

A final example of a prominent hedge fund data vendor is Credit Suisse. Its Credit Suisse Hedge Fund Index is an asset-weighted index that monitors approximately 9,000 funds and consists of funds with a minimum of US\$50 million AUM, a 12-month track record, and audited financial statements. The index is calculated and rebalanced monthly, and it reflects performance net of all performance fees and expenses. Credit Suisse also subdivides managers into nine main sub-indexes for strategy areas: 1) convertible arbitrage; 2) emerging markets; 3) equity market neutral; 4) event driven; 5) fixed income; 6) global macro; 7) long/short equity; 8) managed futures; and 9) multi-strategy.

These different data providers use different methodologies for index calculation. HFR produces both the HFRX Index of equally weighted hedge funds, which includes those that are open or closed to new investment, and its HFRI index series, which tracks only hedge funds open to new investment. Because managers who have closed their funds to new investment are typically superior managers who are limited in their capacity to manage additional funds, the HFRX series regularly outperforms the HFRI series. However, the mix of managers represented by the HFRX Index would obviously not be replicable in real-time by an investor, thus limiting its usefulness. Meanwhile, the Credit Suisse Hedge Fund Index is weighted by fund size (i.e., AUM), so its overall performance is more reflective of the performance of the larger hedge funds, such as the multi-strategy managers.

Notably, less overlap exists in manager reporting to the different index providers than one might expect or is likely optimal. In fact, less than 1% of hedge fund managers self-report to all the index service providers mentioned. Clearly, no single index is all-encompassing.

Generally consistent with the above data vendor groupings and with a practice-based risk factor perspective, this reading groups single hedge fund strategies into the following six categories: 1) equity; 2) event-driven; 3) relative value; 4) opportunistic; 5) specialist; and 6) multi-manager.

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

- **Event-driven hedge fund strategies** focus on corporate events, such as governance events, mergers and acquisitions, bankruptcy, and other key events for corporations. The primary risk for these strategies is event risk, the possibility that an unexpected event will negatively affect a company or security. Unexpected events include unforeseen corporate reorganization, a failed merger, credit rating downgrades, or company bankruptcy. The most common event-driven hedge fund strategies, merger arbitrage and distressed securities, will be discussed in detail.
- **Relative value hedge fund strategies** focus on the relative valuation between two or more securities. These strategies are often exposed to credit and liquidity risks because the valuation differences from which these strategies seek to benefit often are due to differences in credit quality and/or liquidity across different securities. The two common relative value hedge fund strategies to be covered further are fixed-income arbitrage and convertible bond arbitrage.
- **Opportunistic hedge fund strategies** take a top-down approach, focusing on a multi-asset (often macro-oriented) opportunity set. The risks for opportunistic hedge fund strategies depend on the opportunity set involved and can vary across time and asset classes. The two common opportunistic hedge fund strategies that are discussed in further detail are global macro and managed futures.
- **Specialist hedge fund strategies** focus on special or niche opportunities that often require a specialized skill or knowledge of a specific market. These strategies can be exposed to unique risks that stem from particular market sectors, niche securities, and/or esoteric instruments. We will explore two specialist strategies in further detail: volatility strategies involving options and reinsurance strategies.
- **Multi-manager hedge fund strategies** focus on building a portfolio of diversified hedge fund strategies. Managers in this strategy bucket use their skills to combine diverse strategies and dynamically re-allocate among them over time. The two most common types of multi-manager hedge funds are multi-strategy funds and fund-of-funds, which we will discuss in further detail.

Exhibit 1 shows the five single strategy hedge fund buckets that will be covered individually. Multi-strategy funds and fund-of funds—two types of multi-manager strategies—will also be covered. A discussion of each strategy’s contributions to portfolio risk and return will follow.

Exhibit 1 Hedge Fund Strategies by Category

Equity	Event-Driven	Relative Value	Opportunistic	Specialist	Multi-Manager
<ul style="list-style-type: none"> • Long/Short Equity • Dedicated Short Bias • Equity Market Neutral 	<ul style="list-style-type: none"> • Merger Arbitrage • Distressed Securities 	<ul style="list-style-type: none"> • Fixed Income Arbitrage • Convertible Bond Arbitrage 	<ul style="list-style-type: none"> • Global Macro • Managed Futures 	<ul style="list-style-type: none"> • Volatility Strategies • Reinsurance Strategies 	<ul style="list-style-type: none"> • Multi-strategy • Fund-of-Funds

EQUITY STRATEGIES

3

Equity hedge fund strategies invest primarily in equity and equity-related instruments. As mentioned previously, the alpha related to equity strategies tends to derive from the wide variety of equity investments available globally combined with astute long and short stock picking. The size and sign of equity market exposure often dictate the classification of equity hedge fund strategies. As the name suggests, long-only equity hedge fund strategies focus on holding only long positions in equities, and they sometimes use leverage. Long/short equity hedge fund strategies hold both long and short positions in equities that typically result in more-hedged, less-volatile overall portfolios. Short-biased strategies focus on strategic short selling of companies that are expected to lose value in the future (sometimes with an activist inclination, sometimes with long positions in other securities as an offset). Equity market-neutral strategies hold balanced long and short equity exposures to maintain zero (or close to zero) net exposure to the equity market and such factors as sector and size (i.e., market cap). They then focus on, for example, pairs of long and short securities whose prices are out of historical alignment and are expected to experience mean reversion. The following sections discuss long/short equity, dedicated short bias, and equity market-neutral hedge fund strategies.

3.1 Long/Short Equity

Long/short (L/S) equity managers buy equities of companies they expect will rise in value (i.e., they take long positions in undervalued companies) and sell short equities of companies they think will fall in value (i.e., they take short positions in overvalued companies). The objective of long/short equity strategies is to be flexible in finding attractive opportunities on both the long and short sides of the market and to size them within a portfolio. Depending on their specific mandates, long/short equity strategies can shift between industry sectors (e.g., from technology to consumer goods), factors (e.g., from value to growth), and geographic regions (e.g., from Europe to Asia). In practice, however, managers tend to maintain their philosophical biases and areas of focus, typically with a heavy emphasis on fundamental research.

Although market timing using “beta tilts” can play a factor in manager performance, studies have shown that most fundamental long/short equity managers offer little added alpha from such adjustments. They are typically either too net long at market highs or not net long enough at market lows. Most L/S equity managers are not known for their portfolio-level market-timing abilities, but those with such market-timing skills may be particularly valuable from a portfolio allocation perspective.

L/S equity managers also are typically able to take concentrated positions in high conviction buys or sells and can readily apply leverage to increase these positions (although higher levels of leverage are used mostly by quantitatively-oriented managers, not fundamental managers). As a result, stock selection defines manager skill for most L/S equity managers—with market-timing ability being an additive, but generally secondary, consideration. L/S equity is one of the most prevalent hedge fund strategies. It accounts for about 30% of all hedge funds.

3.1.1 Investment Characteristics

Because manager skill derives mainly from stock selection, it is not surprising that individual long/short equity managers tend to have a focus based on their own unique skill sets. As a result, many long/short equity managers specialize in either a specific geographic region, sector, or investment style. However, several key characteristics define long/short equity managers: their strategy focus, their flexibility in holding long and short positions over time, and their use of leverage. Given the specific mandate for

a long/short equity manager, his/her exposures to various equity factors can be very different from other long/short equity managers. For example, a manager focusing on small-cap growth stocks would have a positive exposure to the size factor and a negative exposure to the value factor. Conversely, a manager with a focus on large-cap value stocks would have a negative exposure to the size factor and a positive exposure to the value factor.

Given that equity markets tend to rise over the long run, most long/short equity managers typically hold net long equity positions. Some managers maintain their short positions as a hedge against unexpected market downturns. Other managers are more opportunistic; they tend to take on more short positions after uncovering negative issues with a company's management, strategies, and/or financial statements or whenever their valuation models suggest selling opportunities in certain stocks or sectors. As a result, performance during market crisis periods is important for differentiating between hedge fund managers. Given that hedge funds typically carry high fees, it is important to avoid paying such added fees just for embedded beta exposure that could be achieved more cheaply by investing in traditional long-only strategies. The goal in long/short equity investing is generally to find more sources of idiosyncratic alpha (primarily via stock picking and secondarily by market timing) rather than embedded systematic beta. Exhibit 2 presents some key aspects of this important strategy area.

Exhibit 2 Long/Short Equity—Risk, Liquidity, Leverage, and Benchmarking

Risk Profile and Liquidity

- Diverse opportunities globally create a wide universe from which to create alpha through astute stock picking.
- Diverse investment styles include value/growth, large cap/small cap, discretionary/quantitative, and industry specialized.
- They typically have average exposures of 40%–60% net long, composed of gross exposures of 70%–90% long, vs. 20%–50% short, but they can vary widely. Return profiles are typically aimed to achieve average annual returns roughly equivalent to a long-only approach but with a standard deviation 50% lower than a long-only approach.
- Some managers use index-based short hedges to reduce market risk, but most search for single-name shorts for portfolio alpha and added absolute return.
- Some managers are able to add alpha via market timing of portfolio beta tilt, but evidence suggests that most L/S managers do this poorly.
- This strategy can typically be handled by both limited partner and mutual fund-type vehicles.
- Attractiveness: Liquid, diverse, with mark-to-market pricing driven by public market quotes; added short-side exposure typically reduces beta risk and provides an additional source of potential alpha and reduced portfolio volatility.

Leverage Usage

- Variable: The more market-neutral or quantitative the strategy approach, the more levered the strategy application tends to be to achieve a meaningful return profile.

Exhibit 2 (Continued)

Benchmarking

- L/S equity benchmarks include HFRX and HFRI Equity Hedge Indices; Lipper TASS L/S Equity Hedge; Morningstar/CISDM Equity L/S Index; and Credit Suisse L/S Equity Index.

3.1.2 Strategy Implementation

When long and short stock positions are placed together into a portfolio, the market exposure is the net of the beta-adjusted long and short exposures. For example, with many strong sells and a relatively large short position, the strategy could be net short for brief periods of time. Typically, most long/short equity managers end up with modest net long exposures averaging between 40%–60% net long. Many long/short equity managers are naturally sector-specific, often designing their funds around their industry specialization. Such specialist L/S fund managers analyze fundamental situations that they know well from both a top-down and bottom-up analytical perspective. Natural areas of specialization include potentially more complex sectors, such as telecom/media/technology (TMT), financial, consumer, health care, and biotechnology sectors. Conversely, generalist L/S managers search further afield, thus having flexibility to invest across multiple industry groups. Typically, these generalists avoid complex sectors; for example, they may avoid biotechnology because corporate outcomes may be deemed too binary depending on the success or failure of drug trials. Although generalist managers do take a more balanced and flexible approach, they may miss detailed industry subtleties that are increasingly important to understand in a world where news flows 24/7 and is increasingly nuanced.

Overall, long/short equity investing in most instances is a mix of extracting alpha on the long and short sides from single-name stock selection combined with some naturally net long embedded beta.

EXAMPLE 1

Long/Short Equity Investing Dilemma

The Larson family office views L/S equity investing as a significant portion of the hedge fund universe and would like to access managers talented not only at long investing but also at short selling. However, it does not want to pay high hedge fund fees just for long-biased beta because it has access to long-biased beta at lower fees elsewhere in its portfolio. But, Larson will pay hedge fund fees for strategies that can produce strong risk-adjusted performance in a unique and differentiated fashion.

- 1 Discuss some potential hedge fund strategies the Larson family office should consider adding to its existing portfolio.
- 2 Discuss some of the problems and risks that it may encounter.

Solution to 1:

The Larson family office should consider managers focused on an L/S equity strategy with a sector-specialization as opposed to a generalist fundamental L/S strategy. Generalist L/S managers can benefit from the flexibility to scan a wide universe of stocks to find investments, but they may not be able to develop a sufficient information edge in their analysis to dependably deliver sufficient

alpha relative to their fees and natural long beta positioning. However, managers running specialist L/S equity strategies—especially in such complex sectors as technology, finance, and biotechnology/health care—are more likely to have the specialized capabilities to perform the “deep-dive” differentiated analysis required to develop more original views and stronger portfolio performance.

Solution to 2:

A key problem with selecting sector-specialist L/S equity hedge funds is that they are more difficult to analyze and assess. There are also fewer to choose from compared to generalist L/S hedge funds. Sectors can fall out of favor, risking an allocation to a good fund but in the wrong area given dynamic macroeconomic and financial market conditions. Moreover, generalist L/S strategies, by definition, can readily reallocate capital more efficiently as opportunities emerge in different sectors. Put another way, the Larson family office could potentially find itself with too much single sector, short-sided, or idiosyncratic exposure at the wrong time if it chooses a sector-specialist L/S equity fund.

3.2 Dedicated Short Selling and Short-Biased

Dedicated short-selling hedge fund managers take short-only positions in equities deemed to be expensively priced versus their deteriorating fundamental situations. Such managers may vary their short exposures only in terms of portfolio sizing by, at times, holding higher levels of cash. **Short-biased** hedge fund managers use a less extreme version of this approach. They also search for opportunities to sell expensively priced equities, but they may balance short exposure with some modest value-oriented, or possibly index-oriented, long exposure. This latter approach can potentially help short-biased hedge funds cope with long bull market periods in equities. Both types of short sellers actively aim to create an uncorrelated or negatively correlated source of return by seeking out failing business models, fraudulent accounting, corporate mismanagement, or other factors that may sour the market’s perception of a given equity. Because of the overall secular up-trend in global equity markets, especially across the past several decades, it has been very difficult to be a successful short seller. As a result, fewer such managers are in existence today than in the 1990s.

One exception is the emergence of **activist short selling**, whereby managers take a short position in a given security and then publicly present their research backing the short thesis. Typically, if the hedge fund manager has a solid reputation from its past activist short-selling forays, the release of such research causes a significant stock price plunge into which the activist short seller might cover a portion of its short position. In the United States, this practice has not been deemed to be market manipulation by securities’ regulators as long as the activist short seller is not publishing erroneous information, is not charging for such information (which might create potential conflicts of interest between subscribers and investors), and is acting only in the best interests of its limited partner investors.

3.2.1 Investment Characteristics

Short-selling managers focus on situations involving overvalued equities of companies facing deteriorating fundamentals that typically have not yet been perceived by the market. They also attempt to maximize returns during periods of market declines. If these short-selling managers can achieve success with their approaches, they can provide a unique and useful source of negatively correlated returns compared to many other strategy areas.

Short selling involves borrowing securities, selling them “high,” and then after prices have declined, buying the same securities back “low” and returning them to the lender. To borrow the securities to short sell, the manager must post collateral with the securities lender to cover potential losses. The manager must also pay interest on the securities loan, which can be high if the securities are difficult for the lender to locate. One key risk is that the lender may want the securities back at an inopportune time—such as before the expected price decline has materialized, which could be disadvantageous for the hedge fund manager.

Short selling in general is a difficult investment practice to master in terms of risk management because of the natural phenomenon that positions will grow if prices advance against the short seller but will shrink if prices decline. This is the opposite of what occurs with long-only investing, and it is more difficult to manage. Additionally, access to company management for research purposes can be blocked for fund managers who become known as active short sellers.

From a regulatory perspective, many countries limit or impose stringent rules on short selling. In the United States, the “uptick rule” states that when a stock decreases by 10% or more from its prior closing price, a short sale order can be executed only at a price higher than the current best (i.e., highest) bid. This means the stock’s price must be rising to execute the short sale. Although many emerging markets have allowed short selling, particularly to enhance market liquidity (e.g., the Saudi Stock Exchange allowed short sales beginning in 2016), there is always concern that limits could be placed on short selling during extreme market environments or that regulations could change. For example, for a brief period during the global financial crisis of 2007–2009, new short sales on a designated list of financial stocks were banned by the US SEC to lessen systematic market stress.

Given the difficult operational aspects of short selling, and because equity markets tend to secularly rise over time, successful short-selling managers typically have something of a short-term “attack and retreat” style. The return profile for a successful short-biased manager might best be characterized by increasingly positive returns as the market declines and the risk-free return when the market rises. In some idealized short-selling world, this would entail being short the market during down periods and investing in low-risk government debt when the market is not declining. But, the actual goal of a short seller is to pick short-sale stocks that can still generate positive returns even when the general market trend is up. Skillful, dedicated short-biased managers look for possible short-selling targets among companies that are overvalued, that are experiencing declining revenues and/or earnings, or that have internal management conflicts, weak corporate governance, or even potential accounting frauds. Other possible short-sale candidates are companies that may have single products under development that the short seller believes will ultimately either be unsuccessful or non-repeatable. Exhibit 3 shows some important aspects of this strategy area.

Exhibit 3 Dedicated Short Sellers and Short-Biased—Risk, Liquidity, Leverage, and Benchmarking

Risk Profile and Liquidity

- Dedicated short sellers: They only trade with short-side exposure, although they may moderate short beta by also holding cash.
- Short-biased managers: They are focused on good short-side stock picking, but they may moderate short beta with some value-oriented long exposure or index-oriented long exposure as well as cash.

(continued)

Exhibit 3 (Continued)

- Dedicated short sellers tend to be 60%–120% short at all times. Short-biased managers are typically around 30%–60% net short. The focus in both cases tends to be on single equity stock picking as opposed to index shorting.
- Return goals are typically less than those for most other hedge fund strategies but with a negative correlation benefit. They are more volatile than a typical L/S equity hedge fund given short beta exposure.
- Managers have some ability to add alpha via market timing of portfolio beta tilt, but it is difficult to do with consistency or added alpha.
- This strategy is typically handled best in a limited partnership because of difficult operational aspects of short selling.
- Attractiveness: Liquid, negatively correlated alpha to that of most other strategies, with mark-to-market pricing from public prices. Historic returns have been lumpy and generally disappointing.

Leverage Usage

- Low: There is typically sufficient natural volatility that short-selling managers do not need to add much leverage.

Benchmarking

- Short-biased indexes include Eurekahedge Equity Short Bias Hedge Fund Index and Lipper TASS Dedicated Short-Bias Index. Some investors also compare short-biased funds' returns to the inverse of returns on related stock indexes.

Note: Each index has different methodologies for fund inclusion. Because there are fewer short-selling managers, the construction of an acceptably diverse index is particularly difficult. The Lipper TASS Dedicated Short-Bias Index, for example, includes just four managers.

3.2.2 Strategy Implementation

Because finding strategic selling opportunities is key to dedicated short-biased strategies, stock selection is an important part of the investment process. Short-selling managers typically take a bottom-up approach by scanning the universe of potential sell targets to uncover and sell short those companies whose shares are most likely to substantially decline in value over the relevant time horizon. Managers search for, among other factors, inherently flawed business models, unsustainable levels of corporate leverage, and indications of poor corporate governance and/or accounting gimmickry. Tools that may be helpful to dedicated short-biased managers in finding potential sell candidates include monitoring single name credit default swap spreads, corporate bond yield spreads, and/or implied volatility of exchange-traded put options. Traditional technical analysis and/or pattern recognition techniques may assist the manager in the market timing of short sales. Various accounting ratios and measures, such as the Altman *Z*-score for judging a company's bankruptcy potential and the Beneish *M*-score for identifying potentially fraudulent financial statements, may also be useful. Because of the inherent difficulty and dangers of short selling, most successful short sellers do significant "deep-dive" forensic work on their short-portfolio candidates. As such, short sellers serve as a valuable resource in creating more overall pricing efficiency in the market.

EXAMPLE 2

Candidate for Short-Biased Hedge Fund Strategy

Kit Stone, a short-biased hedge fund manager, is researching Generic Inc. (GI) for possible addition to his portfolio. GI was once a drug industry leader, but for the past 10 years its R&D budgets have declined. Its drug patents have all expired, so it now operates in the competitive generic drug business. GI has staked its future on a new treatment for gastro-intestinal disease. R&D was financed by debt, so GI's leverage ratio is twice the industry average. Early clinical trials were inconclusive. Final clinical trial results for GI's new drug are to be revealed within one month. Although the market is constructive, many medical experts remain doubtful of the new drug's efficacy. Without any further insights into the trial results, Stone reviews the following information.

Generic Inc. (GI)			Industry Average		
PE (X)	PB (X)	T12M EPS Growth	PE (X)	PB (X)	T12M EPS Growth
30	3.5	3%	20	2.5	18%

Additionally, Stone notes that GI shares are very thinly traded, with a high short-interest ratio of 60%. Stone's broker has informed him that it is expensive to borrow GI shares for shorting; they are on "special" (i.e., difficult to borrow), with a high borrowing cost of 20% per year. Moreover, there is an active market for exchange-traded options on GI's shares. Prices of one-month GI options appear to reflect a positive view of the company.

- 1 Discuss whether Stone should add GI shares to his short-biased portfolio.
- 2 Discuss how Stone might instead take advantage of the situation using GI options.

Solution to 1:

Generic Inc. appears to be substantially overvalued. Its main business relies on the competitive generic drug market; it has taken on substantial debt to fund R&D; and skepticism surrounds its new drug. GI's P/Es and P/Bs are higher than industry averages by 50% and 40%, respectively, and its trailing 12-month EPS growth is meager (3% vs. 18% industry average). However, although Stone would normally decide to add GI to his short-biased portfolio, the stock's high short-interest ratio and high cost to borrow (for shorting) are very concerning. Both factors suggest significant potential that a dangerous short-squeeze situation could develop if clinical results really do show efficacy of GI's new drug. So, based on the negative demand/supply dynamics for the stock, Stone decides not to add GI to his portfolio.

Solution to 2:

Stone might instead consider expressing his negative view on GI by simply purchasing put options. Alternatively, Stone could purchase a long put calendar spread, where he would buy a put with expiry beyond and sell a put with expiry before the expected release date of the clinical trial results. In that case, the premium received from writing the shorter tenor put would finance, in part, the cost of buying the longer tenor put. As a third possibility, Stone might even consider buying GI shares and then lending them at the attractive 20% rate. In that case, he would need to hedge this long stock position with the purchase of out-of-the-money puts, thereby creating a protective put position. As a final possibility, if out-of-the-money calls are deemed to be expensive because of

positive sentiment, Stone could sell such calls to finance the purchase of out-of-the-money puts, creating a short risk reversal that provides synthetic short exposure.

3.3 Equity Market Neutral

Equity market-neutral (EMN) hedge fund strategies take opposite (i.e., long and short) positions in similar or related equities that have divergent valuations, and they also attempt to maintain a near net zero portfolio exposure to the market. EMN managers neutralize market risk by constructing their portfolios such that the expected portfolio beta is approximately equal to zero. Moreover, managers often choose to set the betas for sectors or industries as well as for such common risk factors as market size, price-to-earnings ratio, or book-to-market ratio, which are also equal to zero. Because these portfolios do not take beta risk but do attempt to neutralize so many other factor risks, they typically must apply leverage to the long and short positions to achieve a meaningful expected return from their individual stock selections. Approaches vary, but equity market-neutral portfolios are often constructed using highly quantitative methodologies; the portfolios end up being more diverse in their holdings; and the portfolios are typically modified and adjusted over shorter time horizons. The condition of zero market beta can also be achieved with the use of derivatives, including stock index futures and options. Whichever way they are constructed, the overall goal of equity market-neutral portfolios is to capture alpha while minimizing portfolio beta exposure.

Although **pairs trading** is just one subset of equity market-neutral investing, it is an intuitively easy example to consider. With this strategy, pairs are identified of similar under- and overvalued equities, divergently valued shares of a holding company and its subsidiaries, or different share classes of the same company (multi-class stocks typically having different voting rights) in which their prices are out of alignment.

In whatever manner they are created, the pairs are monitored for their typical trading patterns relative to each other—conceptually, the degree of co-integration of the two securities' prices. Positions are established when unusually divergent spread pricing between the two paired securities is observed. Underpinning such a strategy is the expectation that the differential valuations or trading relationships will revert to their long-term mean values or their fundamentally-correct trading relationships, with the long position rising and the short position declining in value. Situations will obviously vary, but strictly quantitative EMN pairs trading, while attempting to minimize overall beta exposure, may still have effective short volatility "tail risk" exposure to abnormal market situations of extreme stress. This is less the case if a fundamental pricing discrepancy is being exploited in anticipation of a possible event that would cause that discrepancy to correct.

Another type of EMN trading is **stub trading**, which entails buying and selling stock of a parent company and its subsidiaries, typically weighted by the percentage ownership of the parent company in the subsidiaries. Assume parent company A owns 90% and 75% of subsidiaries B and C, respectively, and shares of A are determined to be overvalued while shares of B and C are deemed undervalued, all relative to their historical mean valuations. Then, for each share of A sold short, the EMN fund would buy 0.90 and 0.75 shares of B and C, respectively.

Yet another type of EMN approach may involve **multi-class trading**, which involves buying and selling different classes of shares of the same company, such as voting and non-voting shares. As with pairs trading, the degree of co-integration of returns and the valuation metrics for the multi-class shares are determined. If/when prices move

outside of their normal ranges, the overvalued shares are sold short while the undervalued shares are purchased. The goal is to gain on the change in relative pricing on the two securities as market pricing reverts to more normal ranges.

Fundamental trade setups—although not per se “equity market neutral” but still designed to be market neutral—may be created that are long or short equity hedged against offsetting bond exposures if relative pricing between the stocks and bonds is deemed to be out of alignment. Such pairs trading is referred to as capital structure arbitrage and will be discussed in the event-driven strategies section. In these situations, attractive expected outcomes are often created from relative security mispricings designed to exploit potential event situations (e.g., a potential merger or bankruptcy) that would have an impact on relative pricing. Moreover, when two bonds are positioned relative to each other (e.g., to exploit a misunderstood difference in bond covenants or a potential differential asset recovery), a market-neutral strategy can also be employed.

When building market-neutral portfolios, sometimes large numbers of securities are traded and positions are adjusted on a daily or even an hourly basis using algorithm-based models. Managers following this approach are referred to as **quantitative market-neutral** managers. The frequent adjustments implemented by such managers are driven by the fact that market prices change faster than company fundamental factors. This price movement triggers a rebalancing of the EMN portfolio back to a market neutrality. When the time horizon of EMN trading shrinks to even shorter intervals and mean reversion and relative momentum characteristics of market behavior are emphasized, quantitative market-neutral trading becomes what is known as statistical arbitrage trading. With EMN and statistical arbitrage trading, a natural push/pull occurs between maintaining an optimal beta-neutral portfolio and the market impacts and brokerage costs of nearly continuous adjusting of the portfolio. So, many EMN managers use trading-cost hurdle models to determine if and when they should rebalance a portfolio.

Overall, the main source of skill for an EMN manager is in security selection, with market timing being of secondary importance. Sector exposure also tends to be constrained, although this can vary by the individual manager’s approach. Managers that are overall beta neutral and specialize in sector rotation exposure as their source of alpha are known as market-neutral tactical asset allocators or macro-oriented market-neutral managers.

3.3.1 *Investment Characteristics*

Equity market-neutral fund managers seek to insulate their portfolios from movements in the overall market, and they can take advantage of divergent valuations by trading specific securities. As discussed, this is often a quantitatively driven process that uses a substantial amount of leverage to generate meaningful return objectives. However, many discretionary EMN managers implement their positions with significantly less leverage.

Overall, EMN managers generally are more useful for portfolio allocation during periods of non-trending or declining markets because they typically deliver returns that are steadier and less volatile than those of many other hedge strategy areas. Over time, their conservative and constrained approach typically results in less-volatile overall returns than those of managers who accept beta exposure. The exception to this norm is when the use of significant leverage may cause forced portfolio downsizing. By using portfolio margining techniques offered by prime brokers, market-neutral managers may run portfolios with up to 300% long versus 300% short exposures. Prime broker portfolio margining rules generally allow managers to maintain such levered positioning until a portfolio loss of a specified magnitude (i.e., excess drawdown) is

incurred. At the time of such excess drawdown, the prime broker can force the manager to downsize his/her overall portfolio exposure. This is a key strategy risk, particularly for quantitative market-neutral managers.

Despite the use of substantial leverage and because of their more standard and overall steady risk/return profiles, equity market-neutral managers are often considered as preferred replacements for (or at least a complement to) fixed-income managers during periods when fixed-income returns are unattractively low/and or the yield curve is flat. EMN managers are, of course, sourcing a very different type of alpha with very different risks than in fixed-income investing. EMN managers must deal with leverage risk, including the issues of availability of leverage and at what cost, and tail risk, particularly the performance of levered portfolios during periods of market stress. Exhibit 4 presents important aspects of this strategy area.

Exhibit 4 Equity Market Neutral—Risk, Liquidity, Leverage, and Benchmarking

Risk Profile and Liquidity

- They have relatively modest return profiles, with portfolios aimed to be market neutral, and differing constraints to other factors and sector exposures are allowed.
- They generally have high levels of diversification and liquidity and lower standard deviation of returns than many other strategies across normal market conditions.
- Many different types of EMN managers exist, but many are purely quantitative managers (vs. discretionary managers).
- Time horizons vary, but EMN strategies are typically oriented toward mean reversion, with shorter horizons than other strategies and more active trading.
- Because of often high leverage, EMN strategies typically do not meet regulatory leverage limits for mutual fund vehicles. So, limited partnerships are the preferred vehicle.
- Attractiveness: EMN strategies typically take advantage of idiosyncratic short-term mispricing between securities whose prices should otherwise be co-integrated. Their sources of return and alpha, unlike those of many other strategies, do not require accepting beta risk. So, EMN strategies are especially attractive during periods of market vulnerability and weakness.

Leverage Usage

- High: As many beta risks (e.g., market, sector) are hedged away, it is generally deemed acceptable for EMN managers to apply higher levels of leverage while striving for meaningful return targets.

Benchmarking

- Market-neutral indexes include HFRX and HFRI Equity Market Neutral Indices; Lipper TASS Equity Market Neutral Index; Morningstar/CISDM Equity Market Neutral Index; and Credit Suisse Equity Market Neutral Index.
-

3.3.2 Strategy Implementation

Equity market-neutral portfolios are constructed in four main steps. First, the investment universe is evaluated to include only tradable securities with sufficient liquidity and adequate short-selling potential. Second, securities are analyzed for buy and sell opportunities using fundamental models (which use company, industry, and economic data as inputs for valuation) and/or statistical and momentum-based models. Third, a portfolio is constructed with constraints to maintain market risk neutrality, whereby the portfolio's market value-weighted beta is approximately zero and there is often dollar (i.e., money), sector, or other factor risk neutrality. Fourth, the availability and cost of leverage are considered in terms of desired return profile and acceptable potential portfolio drawdown risk. The execution costs of the strategy rebalancing are also introduced as a filter for decision making as to how often the portfolio should be rebalanced. Markets are dynamic because volatility and leverage are always changing; therefore, the exposure to the market is always changing. Consequently, EMN managers must actively manage their funds' exposures to remain neutral over time. However, costs are incurred every time the portfolio is rebalanced. So, EMN managers must be very careful to not allow such costs to overwhelm the security-selection alpha that they are attempting to capture.

Note that the following is a simplified example. In reality, most EMN managers would likely not hedge beta on a stock-by-stock basis but rather would hedge beta on an overall portfolio basis. They would also likely consider other security factor attributes.

EXAMPLE 3

Equity Market-Neutral Pairs Trading:

Ling Chang, a Hong Kong-based EMN manager, has been monitoring PepsiCo Inc. (PEP) and Coca-Cola Co. (KO), two global beverage industry giants. After examining the Asia marketing strategy for a new PEP drink, Chang feels the marketing campaign is too controversial and the overall market is too narrow. Although PEP has relatively weak earnings prospects compared to KO, 3-month valuation metrics show PEP shares are substantially overvalued versus KO shares (relative valuations have moved beyond their historical ranges). As part of a larger portfolio, Chang wants to allocate \$1 million to the PEP versus KO trade and notes the historical betas and S&P 500 Index weights, as shown in the following table.

Stock	Beta	S&P 500 Index Weight
PEP	0.65	0.663
KO	0.55	0.718

Discuss how Chang might implement an EMN pairs trading strategy.

Solution:

Chang should take a short position in PEP and a long position in KO with equal beta-weighted exposures. Given Chang wants to allocate \$1 million to the trade, she would take on a long KO position of \$1 million. Assuming realized betas will be similar to historical betas, to achieve an equal beta-weighted exposure for the short PEP position, Chang needs to short \$846,154 worth of PEP shares [= $-\$1,000,000 / (0.65/0.55)$]. Only the overall difference in performance between PEP and KO shares would affect the performance of the strategy because it will

be insulated from the effect of market fluctuations. If over the next 3 months the valuations of PEP and KO revert to within normal ranges, then this pairs trading EMN strategy should reap profits.

Note: The S&P 500 Index weights are not needed to answer this question.

4

EVENT-DRIVEN STRATEGIES

Event-driven (ED) hedge fund strategies take positions in corporate securities and derivatives that are attempting to profit from the outcome of mergers and acquisitions, bankruptcies, share issuances, buybacks, capital restructurings, re-organizations, accounting changes, and similar events. ED hedge fund managers analyze companies' financial statements and regulatory filings and closely examine corporate governance issues (e.g., management structure, board composition, issues for shareholder consideration, proxy voting) as well as firms' strategic objectives, competitive position, and other firm-specific issues. Investments can be made either proactively in anticipation of an event that has yet to occur (i.e., a **soft-catalyst event-driven approach**), or investments can be made in reaction to an already announced corporate event in which security prices related to the event have yet to fully converge (i.e., a **hard-catalyst event-driven approach**). The hard approach is generally less volatile and less risky than soft-catalyst investing. Merger arbitrage and distressed securities are among the most common ED strategies.

4.1 Merger Arbitrage

Mergers and acquisitions can be classified by the method of purchase: cash-for-stock or stock-for-stock. In a cash-for-stock acquisition, the acquiring company (A) offers the target company (T) a cash price per share to acquire T. For example, assume T's share price is \$30 and A decides to purchase T for \$40 per share (i.e., A is offering a 33% premium to purchase T's shares). In a stock-for-stock acquisition, A offers a specific number of its shares in exchange for 1 T share. So, if A's share price is \$20 and it offers 2 of its shares in exchange for 1 T share, then T's shareholders would receive a value of \$40 per T share, assuming A's share price is constant until the merger is completed. Although merger deals are structured in different ways for many reasons (e.g., tax implications, corporate structure, or provisions to dissuade a merger, such as a "poison pill"¹), acquiring companies are generally more likely to offer cash for their target companies when cash surpluses are high. However, if the stock prices are high and acquiring companies' shares are considered richly valued by management, then stock-for-stock acquisitions can take advantage of potentially overvalued shares as a "currency" to acquire target companies.

4.1.1 Investment Characteristics

In a cash-for-stock acquisition, the merger-arb manager may choose to buy just the target company (T), expecting it to increase in value once the acquisition is completed. In a stock-for-stock deal, the fund manager typically buys T and sells the acquiring company (A) in the same ratio as the offer, hoping to earn the spread on successful deal completion. If the acquisition is unsuccessful, the manager faces losses if the

¹ A poison pill is a pre-offer takeover defense mechanism that gives target company bondholders the right to sell their bonds back to the target at a pre-specified redemption price, typically at or above par; this defense increases the acquirer's need for cash and raises the cost of the acquisition.

price of T (A) has already risen (fallen) in anticipation of the acquisition. Less often, managers take the view that the acquisition will fail—usually due to anti-competition or other regulatory concerns. In this case, he/she would sell T and buy A.

For most acquisitions, the initial announcement of a deal will cause the target company's stock price to rise toward the acquisition price and the acquirer's stock price to fall (either because of the potential dilution of its outstanding shares or the use of cash for purposes other than a dividend payment). The considerable lag time between deal announcement and closing means that proposed merger deals can always fail for any variety of reasons, including lack of financing, regulatory hurdles, and not passing financial due diligence. Hostile takeover bids, where the target company's management has not already agreed to the terms of a merger, are typically less likely to be successfully completed than friendly takeovers, where the target's management has already agreed to merger terms.

Approximately 70%–90% of announced mergers in the United States eventually close successfully. Given the probability that some mergers will not close for whatever reason as well as the costs of establishing a merger arbitrage position (e.g., borrowing the acquiring stock, commissions) and the risk that merger terms might be changed because of market conditions (especially in stressed market environments), merger arbitrage typically offers a 3%–7% return spread depending on the deal-specific risks. Of course, a particularly risky deal might carry an even larger spread. If the average time for merger deal completion is 3–4 months—with managers recycling capital into new deals several times a year and typically applying some leverage to their portfolio positions—then attractive return/risk profiles can be created, earning net annualized returns in the range of 7%–12%, with little correlation to non-deal-specific factors. Diversifying across a variety of mergers, deals, and industries can further help hedge the risk of any one deal failing. So overall, this strategy can be a good uncorrelated source of alpha.

When merger deals do fail, the initial price rise (fall) of the target (acquirer) company is typically reversed. Arbitrageurs who jumped into the merger situation after its initial announcement stand to incur substantial losses on their long (short) position in the target (acquirer)—often as large as negative 20% to 40%. So, the strategy thus does have left-tail risk associated with it.

Corporate events are typically binary: An acquisition either succeeds or fails. The merger arbitrage strategy can be viewed as selling insurance on the acquisition. If the acquisition succeeds (no adverse event occurs), then the hedge fund manager collects the spread (like the premium an insurance company receives for selling insurance) for taking on event risk. If the acquisition fails (an adverse event occurs), then he/she faces the losses on the long and short positions (similar to an insurance company paying out a policy benefit after an insured event has occurred). Thus, the payoff profile of the merger arbitrage strategy resembles that of a riskless bond and a short put option. The merger arbitrage investor also can be viewed as owning an additional call option that becomes valuable if/when another interested acquirer (i.e., White Knight) makes a higher bid for the target company before the initial merger proposal is completed. Exhibit 5 shows risk and return attributes of merger arbitrage investing.

Exhibit 5 Event-Driven Merger Arbitrage—Risk, Liquidity, Leverage, and Benchmarking

Risk Profile and Liquidity

- Merger arbitrage is a relatively liquid strategy—with defined gains from idiosyncratic single security takeover situations but occasional downside shocks when merger deals unexpectedly fail.

(continued)

Exhibit 5 (Continued)

- To the extent that deals are more likely to fail in market stress periods, this strategy has market sensitivity and left-tail risk attributes. Its return profile is insurance-like plus a short put option.
- Because cross-border merger and acquisition (M&A) usually involves two sets of governmental approvals and M&A deals involving vertical integration often face anti-trust scrutiny, these situations carry higher risks and offer wider merger spread returns.
- Some merger arbitrage managers invest only in friendly deals trading at relatively tight spreads, while others embrace riskier hostile takeovers trading at wider spreads. In the latter case, there may be expectations of a higher bid from a White Knight.
- The preferred vehicle is limited partnership because of merger arbitrage's use of significant leverage, but some low-leverage, low-volatility liquid alt merger arbitrage funds do exist.
- Attractiveness: Relatively high Sharpe ratios with typically low double-digit returns and mid–single digit standard deviation (depending on specific levels of leverage applied), but left-tail risk is associated with an otherwise steady return profile.

Leverage Usage

- Moderate to high: Managers typically apply 3 to 5 times leverage to this strategy to generate meaningful target return levels.

Benchmarking

- Sub-indexes include HFRX or HFRI Merger Arbitrage Index; CISDM Hedge Fund Merger Arbitrage Index; and Credit Suisse Merger Arbitrage Index.

4.1.2 Strategy Implementation

Merger arbitrage strategies are typically established using common equities; however, a range of other corporate securities, including preferred stock, senior and junior debt, convertible securities, options, and other derivatives, may also be used for positioning and hedging purposes. Often for a cash-for-stock acquisition, a hedge fund manager may choose to use leverage to buy the target firm. For a stock-for-stock acquisition, leverage may also often be used, but short selling the acquiring firm may be difficult due to liquidity issues or short-selling constraints, especially in emerging markets. Merger arbitrage strategies can utilize derivatives to overcome some short-sale constraints or to manage risks if the deal were to fail. For example, the manager could buy out-of-the money (O-T-M) puts on T and/or buy O-T-M call options on A (to cover the short position).

Convertible securities also provide exposure with asymmetrical payoffs. For example, the convertible bonds of T would also rise in value as T's shares rise because of the acquisition; the convertibles' bond value would provide a cushion if the deal fails and T's shares fall. When the acquiring company's credit is superior to the target company's credit, trades may be implemented using credit default swaps (CDS). In this case, protection would be sold (i.e., shorting the CDS) on the target company to benefit from its improved credit quality (and decline in price of protection and the CDS) once a merger is completed. If the pricing is sufficiently cheap, buying protection

(i.e., going long the CDS) on the target may also be used as a partial hedge against a merger deal failing. Overall market risk (that could potentially disrupt a merger's consummation) might also be hedged by using added short equity index ETFs/futures or long equity index put positions.

In sum, the true source of return alpha for a merger arbitrage hedge fund manager is in the initial decision as to which deals to embrace and which to avoid. However, once involved with a given merger situation, there may be multiple ways to implement a position depending on the manager's deal-specific perspectives.

EXAMPLE 4

Merger Arbitrage Strategy Payoffs

An acquiring firm (A) is trading at \$45/share and has offered to buy target firm (T) in a stock-for-stock deal. The offer ratio is 1 share of A in exchange for 2 shares of T. Target firm T was trading at \$15 per share just prior to the announcement of the offer. Shortly thereafter, T's share price jumps up to \$19 while A's share price falls to \$42 in anticipation of the merger receiving required approvals and the deal closing successfully. A hedge fund manager is confident this deal will be completed, so he buys 20,000 shares of T and sells short 10,000 shares of A.

What are the payoffs of the merger arbitrage strategy if the deal is successfully completed or if the merger fails?

Solution:

At current prices it costs \$380,000 to buy 20,000 shares of T, and \$420,000 would be received for short selling 10,000 shares of A. This provides a net spread of \$40,000 to the hedge fund manager if the merger is successfully completed. If the merger fails, then prices should revert to their pre-merger announcement levels. The manager would need to buy back 10,000 shares of A at \$45 (costing \$450,000) to close the short position, while the long position in 20,000 shares of T would fall to \$15 per share (value at \$300,000). This would cause a total loss of \$110,000 [= (A: +\$420,000 – \$450,000) + (T: –\$380,000 + \$300,000)]. In sum, this merger strategy is equivalent to holding a riskless bond with a face value of \$40,000 (the payoff for a successful deal) and a short binary put option, which expires worthless if the merger succeeds but pays out \$110,000 if the merger fails.

4.2 Distressed Securities

Distressed securities strategies focus on firms that either are in bankruptcy, facing potential bankruptcy, or under financial stress. Firms face these circumstances for a wide variety of reasons, including waning competitiveness, excessive leverage, poor governance, accounting irregularities, or outright fraud. Often the securities of such companies have been sold out of long-only portfolios and may be trading at a significant discount to their eventual work-out value under proper stewardship and guidance. Because hedge funds are not constrained by institutional requirements on minimum credit quality, hedge fund managers are often natural candidates to take positions in such situations. Hedge funds, generally, also provide their investors only periodic liquidity (typically quarterly or sometimes only annually), making the illiquid nature of such securities less problematic than if such positions were held within a mutual fund. Hedge fund managers may find inefficiently priced securities before, during, or after the bankruptcy process, but typically they will be looking to realize their returns somewhat faster than the longer-term orientation of private equity firms. However,

this is not always the case; for example, managers that invest in some distressed sovereign debt (e.g., Puerto Rico, Venezuela) often must face long time horizons to collect their payouts.

At times, distressed hedge fund managers may seek to own the majority or all of a certain class of securities within the capital structure, which enables them to exert creditor control in the corporate bankruptcy or reorganization process. Such securities will vary by country depending on individual bankruptcy laws and procedures. Some managers are active in their distressed investing by building concentrated positions and placing representatives on the boards of the companies they are seeking to turn around. Other distressed managers may be more “passive” in their orientation, relying on others to bear the often substantial legal costs of a corporate capital structure reorganization that may at times involve expensive proxy contests.

By nature, distressed debt and other illiquid assets may take several years to resolve, and they are generally difficult to value. Therefore, hedge fund managers running portfolios of distressed securities typically require relatively long initial lock-up periods (e.g., no redemptions allowed for the first two years) from their investors. Distressed investment managers may also impose fund-level or investor-level redemption gates that are meant to limit the amount of money that investors (i.e., limited partners) may withdraw from a partnership during any given quarter. As for valuing distressed securities, external valuation specialists may be needed to provide an independent estimate of fair value. Valuations of distressed securities with little or no liquidity (e.g., those deemed Level 3 assets for US accounting purposes) are subject to the smoothing effect of “mark-to-model” price determination.

The bankruptcy process typically results in one or two outcomes: liquidation or firm re-organization. In a liquidation, the firm’s assets are sold off over some time period; then, based on the priority of their claim, debt- and equity-holders are paid off sequentially. In this case, claimants on the firm’s assets are paid in order of priority from senior secured debt, junior secured debt, unsecured debt, convertible debt, preferred stock, and finally common stock. In a re-organization, a firm’s capital structure is re-organized and the terms for current claims are negotiated and revised. Current debtholders may agree to extend the maturity of their debt contracts or even to exchange their debt for new equity shares. In this case, existing equity would be canceled (so existing shareholders would be left with nothing) and new equity issued, which would also be sold to new investors to raise funds to improve the firm’s financial condition.

4.2.1 *Investment Characteristics*

Distressed securities present new sets of risks and opportunities and thus require special skills and increased monitoring. As previously mentioned, many institutional investors, like banks and insurance companies, by their mandates cannot hold non-investment-grade securities in their portfolios. As a result, many such investors must sell off investments in firms facing financial distress. This situation may result in illiquidity and significant price discounting when trades do occur, but it also creates potentially attractive opportunities for hedge funds. Moreover, the movement from financial distress to bankruptcy can unfold over long periods and because of the complexities of legal proceedings, informational inefficiencies cause securities to be improperly valued.

To successfully invest in distressed securities, hedge fund managers require specific skills for analyzing complicated legal proceedings, bankruptcy processes, creditor committee discussions, and re-organization scenarios. They also must be able to anticipate market reactions to these actions. At times, and depending on relative pricing, managers may establish “capital structure arbitrage” positions: For the same distressed entity, they may be long securities where they expect to receive acceptable recoveries but short other securities (including equity) where the value-recovery prospects are dim.

Current market conditions also affect the success of distressed securities strategies. In liquidation, assets may need to be sold quickly, and discounted selling prices will lower the total recovery rate. When illiquid assets must be sold quickly, forced sales and liquidity spirals may lead to fire-sale prices. For re-organizations, current market conditions partly determine whether (and how much) a firm can raise capital from asset sales and/or from the issuance of new equity. Exhibit 6 provides some key attributes of distressed securities investing.

Exhibit 6 Distressed Securities—Risk, Liquidity, Leverage, and Benchmarking

Risk Profile and Liquidity

- The return profile for distressed securities investing is typically at the higher end of event-driven strategies but with more variability.
- Outright shorts or hedged positions are possible, but distressed securities investing is usually long-biased. It is subject to security-specific outcomes but still impacted by the health of the macro-economy.
- Distressed securities investing typically entails relatively high levels of illiquidity, especially if using a concentrated activist approach. Pricing may involve “mark-to-model” with return smoothing. Ultimate results are generally binary: either very good or very bad.
- Attractiveness: Returns tend to be “lumpy” and somewhat cyclical. Distressed investing is particularly attractive in the early stages of an economic recovery after a period of market dislocation.

Leverage Usage

- Moderate to low: Because of the inherent volatility and long-biased nature of distressed securities investing, hedge fund managers utilize modest levels of leverage, typically with 1.2 to 1.7 times NAV invested, and with some of the nominal leverage from derivatives hedging.

Benchmarking

- Hedge fund sub-indexes include HFRX and HFRI Distressed Indices; CISDM Distressed Securities Index; Lipper TASS Event-Driven Index; and Credit Suisse Event Driven Distressed Hedge Fund Index.

Note: Alpha produced by distressed securities managers tends to be idiosyncratic. Also, the strategy capitalizes on information inefficiencies and structural inabilities of traditional managers to hold such securities.

4.2.2 Strategy Implementation

Hedge fund managers take several approaches when investing in distressed securities. In a liquidation situation, the focus is on determining the recovery value for different classes of claimants. If the fund manager’s estimate of recovery value is higher than market expectations, perhaps due to illiquidity issues, then he/she can buy the undervalued debt securities in hopes of realizing the higher recovery rate. For example, assume bankrupt company X’s senior secured debt is priced at 50% of par. By conducting research on the quality of the collateral and by estimating potential cash flows (and their timing) in liquidation, the hedge fund manager estimates a recovery

rate of 75%. He/she can buy the senior secured debt and expect to realize the positive difference in recovery rates. However, even assuming the manager is correct, if the liquidation process drags on and/or market conditions deteriorate, then this premium may be only partly realized, if at all.

In a reorganization situation, the hedge fund manager's focus is on how the firm's finances will be restructured and on assessing the value of the business enterprise and the future value of different classes of claims. There are various avenues for investing in a re-organization. The manager will evaluate the different securities of the company in question and purchase those deemed to be undervalued given the likely re-organization outcome. The selection of security will also depend on whether the manager seeks a control position or not. If so, he/she will be active in the negotiating process and will seek to identify fulcrum securities that provide leverage (or even liquidation) in the reorganization. **Fulcrum securities** are partially-in-the-money claims (not expected to be repaid in full) whose holders end up owning the reorganized company. Assuming the re-organization is caused by excessive financial leverage but the company's operating prospects are still good, a financial restructuring may be implemented whereby senior unsecured debt purchased by the hedge fund manager is swapped for new shares (existing debt and equity are cancelled) and new equity investors inject fresh capital into the company. As financial distress passes and the intrinsic value of the reorganized company rises, an initial public offering (IPO) would likely be undertaken. The hedge fund manager could then exit and earn the difference between what was paid for the undervalued senior unsecured debt and the proceeds received from selling the new shares of the revitalized company in the IPO.

EXAMPLE 5

Capital Structure Arbitrage in the Energy Crisis of 2015–2016

With a sudden structural increase in US energy reserves caused by modern fracking techniques, oil prices tumbled dramatically from more than \$60/barrel in mid-2015 to less than \$30/barrel in early 2016. Debt investors suddenly became concerned about the very survivability of the smaller, highly levered exploration and production (E&P) companies if such low energy prices were to persist. Prices of many energy-related, junior, unsecured, non-investment-grade debt securities fell dramatically. However, retail equity investors generally reacted more benignly. As a result, the shares of several such E&P companies still carried significant implied enterprise value while their debt securities traded as if bankruptcy was imminent.

- 1 Discuss why such a divergence in the valuation of the debt and equity securities of these E&P companies might have occurred.
- 2 Discuss how a hedge fund manager specializing in distressed securities might take advantage of this situation.

Solution to 1:

This divergence in valuation occurred because of structural differences between the natural holders of debt and equity securities. Institutional holders of the debt likely felt more compelled, or in some cases were required by investment policy, to sell these securities as credit ratings on these bonds were slashed. Retail equity investors were likely less informed as to the potential seriousness of the impact of such a sharp energy price decline on corporate survivability. With equity markets overall still moving broadly higher, retail equityholders may have been expressing a “buy the dip” mentality. Such cross-asset arbitrage

situations represent a significant opportunity for nimble and flexible hedge fund managers that are unrestrained by a single asset class perspective or other institutional constraints.

Solution to 2:

An astute hedge fund manager would have realized three key points: 1) the junior unsecured debt securities were temporarily undervalued; 2) although bankruptcy in certain specific companies was indeed possible (depending on how long energy prices stayed low), detailed research could uncover those E&P companies for which bankruptcy was less likely; and 3) the unsecured debt securities could be purchased with some safety by shorting the still overvalued equities (or buying put options on those equities) as a hedge.

If energy prices subsequently remained low for too long and bankruptcy was indeed encountered, the equities would become worthless. However, the unsecured debt might still have some recovery value from corporate asset sales, or these securities might become the fulcrum securities that would be converted in a bankruptcy reorganization into new equity in an ongoing enterprise. Alternatively, if oil prices were to recover (as indeed transpired; oil prices closed 2017 at more than \$60/barrel), the unsecured debt securities of many of these companies would rebound far more substantially than their equity shares would rise.

In sum, a distressed securities hedge fund arbitrageur willing to take a position in the unsecured debt hedged against short equity (or long puts on the equity) could make money under a variety of possible outcomes.

RELATIVE VALUE STRATEGIES

5

We have previously described equity market-neutral investing as one specific equity-oriented relative value hedge fund approach, but other types of relative value strategies are common for hedge funds involving fixed-income securities and hybrid convertible debt. Like equity market-neutral trading, many of these strategies involve the significant use of leverage. Changes in credit quality, liquidity, and implied volatility (for securities with embedded options) are some of the causes of relative valuation differences. During normal market conditions, successful relative value strategies can earn credit, liquidity, or volatility premiums over time. But, in crisis periods—when excessive leverage, deteriorating credit quality, illiquidity, and volatility spikes come to the fore—relative value strategies can result in losses. Fixed-income arbitrage and convertible bond arbitrage are among the most common relative value strategies.

5.1 Fixed-Income Arbitrage

Fixed-income arbitrage strategies attempt to exploit pricing inefficiencies by taking long and short positions across a range of debt securities, including sovereign and corporate bonds, bank loans, and consumer debt (e.g., credit card loans, student loans, mortgage-backed securities). Arbitrage opportunities between fixed-income instruments may develop because of variations in duration, credit quality, liquidity, and optionality.

5.1.1 *Investment Characteristics*

In its simplest form, fixed-income arbitrage involves buying the relatively undervalued securities and short selling the relatively overvalued securities with the expectation that the mispricing will resolve itself (reversion back to normal valuations) within the specified investment horizon. Valuation differences beyond normal historical ranges can result from differences in credit quality (investment-grade versus non-investment-grade securities), differences in liquidity (on-the-run versus off-the-run securities), differences in volatility expectations (especially for securities with embedded options), and even differences in issue sizes. More generally, fixed-income arbitrage can be characterized as exploiting price differences relative to expected future price relationships, with mean reversion being one important aspect. In many instances, realizing a net positive relative carry over time may also be the goal of the relative security positioning, which may involve exploiting kinks in a yield curve or an expected shift in the shape of a yield curve.

Where positioning may involve the acceptance of certain relative credit risks across different security issuers, fixed-income arbitrage morphs into what is more broadly referred to as L/S credit trading. This version of trading tends to be naturally more volatile than the exploitation of small pricing differences within sovereign debt alone.

Unless trading a price discrepancy directly involves establishing a desired yield curve exposure, fixed-income arbitrageurs will typically immunize their strategies, which involve both long and short positions, from interest rate risk by taking duration-neutral positions. However, duration neutrality provides a hedge against only small shifts in the yield curve. To hedge against large yield changes and/or non-parallel yield curve movements (i.e., steepening or flattening), the manager might employ a range of fixed-income derivatives, including futures, forwards, swaps, and swaptions (i.e., options on a swap). Moreover, fixed-income securities also vary in their complexity. For example, in addition to interest rate risk, straight government debt is exposed to sovereign risk (and potentially currency risk), which can be substantial in many countries, while asset-backed and mortgaged-backed securities are subject to credit risk and pre-payment risk. Derivatives are also useful for hedging such risks.

Fixed-income security pricing inefficiencies are often quite small, especially in the more-efficient developed capital markets, but the correlation aspects across different securities is typically quite high. Consequently, it may be necessary and acceptable to utilize substantial amounts of leverage to exploit these inefficiencies. Typical leverage ratios in fixed-income arbitrage strategies can be 4 to 5 times (assets to equity). In the case of some market-neutral multi-strategy funds, where fixed-income arbitrage may form just a portion of total risk, fixed-income arbitrage leverage levels can sometimes be as high as 12 to 15 times assets to equity. Of course, leverage will magnify the myriad risks to which fixed-income strategies are exposed, especially during stressed market conditions.

Another factor that has compounded the risks of fixed-income arbitrage strategies has been the inclination of financial engineers to create tranching, structured products around certain fixed-income cash flows—particularly involving residential mortgages—to isolate certain aspects of credit risk and prepayment risk. For example, within a pool of mortgages, cash flows may be divided such that some credit tranche holders have seniority over others or so that interest-only income payments flow to one set of holders and principal-only payoffs flow to another set of holders. The risks of relative value strategies involving mortgage-related securities, which are especially relevant during periods of market stress, include negative convexity aspects of many mortgage-backed securities and some of the structured products built around them; underlying default rates potentially exceeding expectations and resulting in a high-volatility environment; balance sheet leverage of hedge funds; and hedge fund investor redemption pressures.

Globally, fixed-income markets are substantially larger in total issuance size and scale than equity markets and come in a myriad of different securities types. Away from on-the-run government securities and other sovereign-backed debt securities, which in most developed financial markets are generally very liquid, the liquidity aspects of many fixed-income securities are typically poor. This creates relative value arbitrage opportunities for hedge fund managers, but it also entails positioning and liquidity risks in portfolio management. Natural price opaqueness must often be overcome—particularly for “off-the-run” securities that may trade only occasionally. Liquidity in certain municipal bond markets and corporate debt markets, for example, can be particularly thin. Some key points of fixed-income arbitrage appear in Exhibit 7.

Exhibit 7 Fixed-Income Arbitrage—Risk, Liquidity, Leverage, and Benchmarking

Risk Profile and Liquidity

- The risk/return profile of fixed-income arbitrage trading derives from the high correlations found across different securities, the yield spread pick-up to be captured, and the sheer number of different types of debt securities across different markets with different credit quality and convexity aspects in their pricing. Structured products built around debt securities introduce added complexity that may result in mispricing opportunities.
- Yield curve and carry trades within the US government universe tend to be very liquid but typically have the fewest mispricing opportunities. Liquidity for relative value positions generally decreases in other sovereign markets, mortgage-related markets, and especially across corporate debt markets.
- Attractiveness: A function of correlations between different securities, the yield spread available, and the high number and wide diversity of debt securities across different markets.

Leverage Usage

- High: This strategy has high leverage usage, but leverage availability typically diminishes with product complexity. To achieve the desired leverage, prime brokers offer collateralized repurchase agreements with associated leverage “haircuts” depending on the types of securities being traded. The haircut is the prime broker’s cushion against market volatility and illiquidity if posted collateral ever needs to be liquidated.

Benchmarking

- This is a broad category that encompasses the following sub-indexes: HFRX and HFRI Fixed Income Relative Value Indices; Lipper TASS Fixed Income Arbitrage Index; CISDM Debt Arbitrage Index; and Credit Suisse Fixed Income Arbitrage Index.

Note: HFRX and HFRI also offer more granular hedge fund fixed-income, relative value indexes related to sovereign bonds trading, credit trading, and asset-backed trading.

5.1.2 Strategy Implementation

The most common types of fixed-income arbitrage strategies include yield curve trades and carry trades. Considering yield curve trades, the prevalent calendar spread strategy involves taking long and short positions at different points on the yield curve where the relative mispricing of securities offers the best opportunities, such as in a curve flattening or steepening, to profit. Perceptions and forecasts of macroeconomic conditions are the backdrop for these types of trades. The positions can be in fixed-income securities of the same issuer; in that case, most credit and liquidity risks would likely be hedged, making interest rate risk the main concern. Alternatively, longs and shorts can be taken in the securities of different issuers—but typically ones operating in the same industry or sector. In this case, differences in credit quality, liquidity, volatility, and issue-specific characteristics would likely drive the relative mispricing. In either case, the hedge fund manager aims to profit as the mispricing reverses (mean reversion occurs) and the longs rise and shorts fall in value within the targeted time frame.

Carry trades involve going long a higher yielding security and shorting a lower yielding security with the expectation of receiving the positive carry and of profiting on long and short sides of the trade when the temporary relative mispricing reverts to normal. A classic example of a fixed-income arbitrage trade involves buying lower liquidity, off-the-run government securities and selling higher liquidity, duration matched, on-the-run government securities. Interest rate and credit risks are hedged because long and short positions have the same duration and credit exposure. So, the key concern is liquidity risk. Under normal conditions, as time passes the more (less) expensive on- (off-) the-run securities will decrease (increase) in price as the current on-the-runs are replaced by a more liquid issue of new on-the-run bonds that then become off-the-run bonds.

The payoff profile of this fixed-income arbitrage strategy resembles a short put option. If the strategy unfolds as expected, it returns a positive carry plus a profit from spread narrowing. But, if the spread unexpectedly widens, then the payoff becomes negative. Mispricing of government securities is generally small, so substantial leverage would typically be used to magnify potential profits. But, with highly levered positions, even a temporary negative price shock can be sufficient to set off a wave of margin calls that force fund managers to sell at significant losses. Such a scenario in the wake of the 1997 Asian Financial Crisis and the 1998 Russian Ruble Crisis led to the collapse and subsequent US Federal Reserve-supervised bailout of legendary hedge fund Long-Term Capital Management. It is important to note that there are far more complex relative value fixed-income strategies beyond just yield curve trades, carry trades, or relative credit trades.

EXAMPLE 6

Fixed-Income Arbitrage: Treasuries vs. Inflation Swap + TIPS

Guernsey Shore Hedge Fund closely monitors government bond markets and looks for valuation discrepancies among the different issues.

Portfolio manager Nick Landers knows that Treasury Inflation-Protected Securities (TIPS) pay a coupon (i.e., real yield) while accruing inflation into the principal, which is paid at maturity. This insulates the TIPS owner from inflation risk.

Landers also understands that because the US government issues both TIPS and Treasuries that have the same maturity, they should trade at similar yields after adjusting for inflation. Landers knows that by using OTC inflation swaps, the inflation-linked components of TIPS can be locked in, thereby fixing all payments to be similar to those of a Treasury bond.

After accounting for expected inflation in normal periods, global investors often prefer Treasuries to inflation-indexed bonds. This may be because market participants do not fully trust the way inflation may be measured over time. As such, inflation-hedged TIPS (as a package with the associated offsetting inflation swap) have typically yielded about 25 bps to 35 bps more than similar maturity Treasuries.

During a period of extreme market distress, in November 2XXX, Landers keenly observed that TIPS were particularly mispriced. Their yields, adjusted for inflation, were substantially higher than straight Treasuries, while inflation swaps were priced as if outright deflation was imminent. Landers notes the information on the relative pricing of these different products and considers whether to implement the follow trade:

November 2XXX	Fixed Rate	Inflation Rate	Cost
Buy 5-year TIPS	Receive 3.74%	Receive inflation	–1,000,000
Short 5-year Treasuries	Pay 2.56%	—	+1,000,000
Inflation swap: receive fixed rate and pay inflation index	Receive 1.36%	Pay inflation	0
Net of three trades	Receive 2.54%	—	0

Discuss whether Landers has uncovered a risk-free arbitrage, and if so, discuss some of the risks he may still face with its execution.

Solution:

The situation observed by Landers occurred during a period of extreme market stress. In such turbulent times, instances of very attractive, near risk-free arbitrage can occur, as in this case. Often these periods are characterized by a fear of deflation, so straight Treasury bonds are in high demand for flight-to-quality reasons. But there would be some operational hurdles to overcome. For Landers to short the expensive Treasuries and buy the more attractive TIPS, Guernsey Shore would need access as a counterparty to the interbank repurchase market to borrow the Treasury bonds. Bank credit approval [via an International Swaps and Derivatives Association (ISDA) relationship] would also be required for accessing the inflation swap market for yield enhancement and to lock in the inflation hedge. Unfortunately, during periods of extreme market distress, credit lines to hedge funds typically shrink (or are withdrawn), not expanded. Moreover, there is potential for “losing the borrow” on the short Treasuries (i.e., the lender demanding return of his/her Treasuries), which makes the trade potentially difficult to maintain. Assuming Guernsey Shore met these operational requirements, Landers would need to act quickly to capture the fixed-income arbitrage profit of 2.54%. Such extreme levels of arbitrage rarely persist for very long.

5.2 Convertible Bond Arbitrage

Convertible bonds are hybrid securities that can be viewed as a combination of straight debt plus a long equity call option with an exercise price equal to the strike price times the conversion ratio (also known as conversion value). The conversion ratio is the number of shares for which the bond can be exchanged. The bond’s

current conversion price is the current stock price times the conversion ratio. If the bond's current conversion price is significantly below the conversion value, the call is out-of-the-money and the convertible bond will behave more like a straight bond. Conversely, if the conversion price is significantly above the conversion value, the call is in-the-money and the convertible bond will behave more like the underlying equity.

5.2.1 *Investment Characteristics*

Convertible securities are naturally complex and thus generally not well understood. They are impacted by numerous factors, including overall interest rate levels, corporate credit spreads, bond coupon and principal cash flows, and the value of the embedded stock option (which itself is influenced by dividend payments, stock price movements, and equity volatility). Convertibles are often issued sporadically by companies in relatively small sizes compared to straight debt issuances, and thus they are typically thinly-traded securities. Moreover, most convertibles are non-rated and typically have fewer covenants than straight bonds. Because the equity option value is embedded within such thinly-traded, complex securities, the embedded options within convertibles tend to trade at relatively low implied volatility levels compared to the historical volatility level of the underlying equity. Convertibles also trade cyclically relative to the amount of new issuance of such securities in the overall market. The higher the new convertible issuance that the market must absorb, the cheaper their pricing and the more attractive the arbitrage opportunities for a hedge fund manager.

The key problem for the convertible arbitrage manager is that to access and extract the relatively cheap embedded optionality of the convertible, he/she must accept or hedge away other risks that are embedded in the convertible security. These include interest rate risk, credit risk of the corporate issuer, and market risk (i.e., the risk that the stock price will decline and thus render the embedded call option less valuable). Should the convertible manager desire, all these risks can be hedged using a combination of interest rate derivatives, credit default swaps, and short sales of an appropriate delta-adjusted amount of the underlying stock. The purchase of put options can also be a stock-sale substitute. The use of any such hedging tools may also erode the very attractiveness of the targeted convertible holding.

Convertible managers who are more willing to accept credit risk may choose to not hedge the credit default risk of the corporate issuer; instead, they will take on the convertible position more from a credit risk perspective. Such managers are known as credit-oriented convertible managers. Other managers may hedge the credit risk but will take a more long-biased, directional view of the underlying stock and then underhedge the convertible's equity exposure. Yet other managers may overhedge the equity risk to create a bearish tilt with respect to the underlying stock, thus providing a more focused exposure to increased volatility. These managers are referred to as volatility-oriented convertible managers. In sum, several different ways and styles can be utilized to set up convertible arbitrage exposures. Exhibit 8 presents some key aspects of convertible bond arbitrage.

Exhibit 8 Convertible Bond Arbitrage—Risk, Liquidity, Leverage, and Benchmarking

Risk Profile and Liquidity

- Convertible arbitrage managers strive to extract and benefit from this structurally cheap source of implied volatility by delta hedging and gamma trading short equity hedges against their long convertible holdings.

Exhibit 8 (Continued)

- Liquidity issues surface for convertible arbitrage strategies in two ways: 1) naturally less-liquid securities because of their relatively small issue sizes and inherent complexities; 2) availability and cost to borrow underlying equity for short selling.
- Attractiveness: Convertible arbitrage works best during periods of high convertible issuance, moderate volatility, and reasonable market liquidity. It fares less well in periods of acute credit weakness and general illiquidity, when the pricing of convertible securities is unduly impacted by supply/demand imbalances.

Leverage Usage

- High: Because of many legs needed to implement convertible arbitrage trades (e.g., short sale, CDS transaction, interest rate hedge), relatively high levels of leverage are used to extract a modest ultimate gain from delta hedging. Managers typically run convertible portfolios at 300% long vs. 200% short, the lower short exposure being a function of the delta-adjusted equity exposure needed from short sales to balance the long convertible.

Benchmarking

- Sub-indexes include HFRX and HFRI FI-Convertible Arbitrage Indices; Lipper TASS Convertible Arbitrage Index; CISDM Convertible Arbitrage Index; and Credit Suisse Convertible Arbitrage Index.

Note: Convertible bond arbitrage is a core hedge fund strategy area that is run within many multi-strategy hedge funds together with L/S equity, merger arbitrage, and other event-driven distressed strategies.

5.2.2 Strategy Implementation

A classic convertible bond arbitrage strategy is to buy the relatively undervalued convertible bond and take a short position in the relatively overvalued underlying stock. The number of shares to sell short to achieve a delta neutral overall position is determined by the delta of the convertible bond. For convertible bonds with high bond conversion prices relative to the conversion value, the delta will be close to 1. For convertibles with low bond conversion prices relative to the conversion value, the delta will be closer to 0. The combination of a long convertible and short equity delta exposure would create a situation where for small changes in the equity price, the portfolio will remain essentially balanced. As the underlying stock price moves further, however, the delta hedge of the convertible will change because the convertible is an instrument with the natural positive convexity attributes of positive gamma. Because stock gamma is always zero, the convertible arbitrage strategy will leave the convertible arbitrageur “synthetically” longer in total equity exposure as the underlying security price rises and synthetically less long as the equity price falls. This added gamma-driven exposure can then be hedged at favorable levels with appropriate sizing adjustments of the underlying short stock hedge—selling more stock at higher levels and buying more stock at lower levels. The convertible arbitrage strategy will be profitable given sufficiently large stock price swings and proper periodic rebalancing (assuming all else equal). If realized equity volatility exceeds the implied volatility of the convertible’s embedded option (net of hedging costs), an overall gain is achieved by the arbitrageur.

Several circumstances can create concerns for a convertible arbitrage strategy. First, when short selling, shares must be located and borrowed; as a result, the stock owner may subsequently want his/her shares returned at a potentially inopportune time, such as during stock price run-ups or more generally when supply for the stock is low or demand for the stock is high. This situation, particularly a short squeeze, can lead to substantial losses and a suddenly unbalanced exposure if borrowing the underlying equity shares becomes too difficult or too costly for the arbitrageur (of course, initially locking in a “borrow” over a “term period” can help the arbitrageur avoid short squeezes, but this may be costly to execute). Second, credit issues may complicate valuation given that bonds have exposure to credit risk; so when credit spreads widen or narrow, there would be a mismatch in the values of the stock and convertible bond positions that the convertible manager may or may not have attempted to hedge away. Third, the strategy can lose money because of time decay of the convertible bond’s embedded call option during periods of reduced realized equity volatility and/or from a general compression of market implied volatility levels.

Convertible arbitrage strategies have performed best when convertible issuance is high (implying a wider choice among convertible securities and generally cheaper prices), general market volatility levels are moderate, and the liquidity to trade and adjust positions is ample. On the other hand, extreme market volatility also typically implies heightened credit risks; given that convertibles are naturally less-liquid securities, convertible managers generally do not fare well during such periods. The fact that hedge funds have become the natural market makers for convertibles and they typically face significant redemption pressures from investors during crises implies further unattractive left-tail risk attributes to the strategy during periods of market stress.

EXAMPLE 7

Convertible Arbitrage Strategy

Cleopatra Partners is a Dubai-based hedge fund engaging in convertible bond arbitrage. Portfolio manager Shamsa Khan is considering a trade involving the euro-denominated convertible bonds and stock of QXR Corporation. She has assembled the following information:

QXR Convertible Bond

Price (% of par)	120	—
Coupon (%)	5.0	—
Remaining maturity (years)	1.0	
Conversion ratio	50	—
S&P Rating	BBB	—

QXR Inc.

Industry Average

Price (per share)	30	--
P/E (x)	30	20
P/BV (x)	2.25	1.5
P/CF (x)	15	10

Additional Information:

- It costs €2 to borrow each QXR share (paid to the stock lender) to carry the short position for a year.
 - The stock pays a €1 dividend.
- 1 Discuss (using only the information in the table) the basic trade setup that Khan should implement.
 - 2 Demonstrate (without using the additional information) that potential profits earned are the same whether QXR's share price falls to €24, rises to €36, or remains flat at €30.
 - 3 Discuss (using also the additional information) how the results of the trade will change.

Solution to 1:

QXR's convertible bond price is €1,200 [$= €1,000 \times (120/100)$], and its conversion ratio is 50; so, the conversion price is €24 ($€1,200/50$). This compares with QXR's current share price of €30. QXR's share valuation metrics are all 50% higher than its industry's averages. It can be concluded that in relative terms, QXR's shares are overvalued and its convertible bonds are undervalued. Thus, Khan should buy the convertibles and short sell the shares.

Solution to 2:

By implementing this trade and buying the bond at €1,200, exercising the bond's conversion option, and selling her shares at the current market price, Khan can lock in a profit of €6 per share under any of the scenarios mentioned, as shown in the following table:

QXR Share Price	Profit on:		
	Long Stock via Convertible Bond	Short Stock	Total Profit
24	0	6	6
36	12	-6	6
30	6	0	6

Solution to 3:

The €2 per share borrowing costs and the €1 dividend payable to the lender together represent a €3 per share outflow that Khan must pay. But, the convertible bond pays a 5% coupon or €50, which equates to an inflow of €1 per share equivalent ($€50 \text{ coupon}/50 \text{ shares per bond}$). Therefore, the total profit outcomes, as indicated in the table, would each be reduced by €2. In sum, Khan would realize a total profit of €4 per each QXR share.

OPPORTUNISTIC STRATEGIES

6

Opportunistic hedge fund strategies seek to profit from investment opportunities across a wide range of markets and securities using a variety of techniques. They invest primarily in asset classes, sectors, regions, and across macro themes and multi-asset relationships on a global basis (as opposed to focusing on the individual security level). So, broad themes, global relationships, market trends, and cycles affect their returns.

Although opportunistic hedge funds can sometimes be difficult to categorize and may use a variety of techniques, they can generally be divided by 1) the type of analysis and approach that drives the trading strategy (technical or fundamental), 2) how trading decisions are implemented (discretionary or systematic), and 3) the types of instruments and/markets in which they trade. Fundamental-based strategies use economic data as inputs and focus on fair valuation of securities, sectors, markets, and intra-market relationships. Technical analysis utilizes statistical methods to predict relative price movements based on past price trends.

Discretionary implementation relies on manager skills to interpret new information and make investment decisions, and it may be subject to such behavioral biases as overconfidence and loss aversion. Systematic implementation is rules-based and executed by computer algorithms with little or no human intervention; however, it may encounter difficulty coping with new, complex situations (not seen historically). As the absolute size of systematic trend-following funds has increased in significance, so too has the issue of negative execution slippage caused by the simultaneous reversal of multiple trend-following models that sometimes create a “herding effect.” Such effects can temporarily overwhelm normal market liquidity and at times temporarily distort fundamental market pricing of assets (i.e., trend-following “overshoots” caused by momentum-signal triggers). We now discuss the two most common hedge fund strategies: global macro and managed futures.

6.1 Global Macro Strategies

Global macro strategies focus on global relationships across a wide range of asset classes and investment instruments, including derivative contracts (e.g., futures, forwards, swaps, and options) on commodities, currencies, precious and base metals, and fixed-income and equity indexes—as well as on sovereign debt securities, corporate bonds, and individual stocks. Given the wide range of possibilities to express a global macro view, these strategies tend to focus on certain themes (e.g., trading undervalued emerging market currencies versus overvalued US dollar using OTC currency swaps), regions (e.g., trading stock index futures on Italy’s FTSE MIB versus Germany’s DAX to capitalize on differences in eurozone equity valuations), or styles (e.g., systematic versus discretionary spread trading in energy futures). Global macro managers typically hold views on the relative economic health and central bank policies of different countries, global yield curve relationships, trends in inflation and relative purchasing power parity, and capital trade flow aspects of different countries (typically expressed through relative currency or rate-curve positioning).

Global macro managers tend to be anticipatory and sometimes contrarian in setting their strategies. Some macro managers may try to extract carry gains or ride momentum waves, but most have a tendency to be early in their positioning and then benefit when some rationality eventually returns to relative market pricing. This can make an allocation to global macro strategies particularly useful when a sudden potential reversal in markets is feared. For example, many global macro managers sensed the developing sub-prime mortgage crisis in the United States as early as 2006. They took on long positions in credit default swaps (CDS) (i.e., they purchased protection) on mortgage bonds, on tranches of mortgage structured products, or simply on broader credit indexes that they deemed particularly vulnerable to weakening credit conditions. Although they had to wait until 2007–2008 for these CDS positions to pay off, some global macro managers performed spectacularly well as market conditions morphed into the global financial crisis. Including global macro managers with significant subprime mortgage-focused CDS positions within a larger portfolio turned out to be a very valuable allocation.

It is important to note that because global macro managers trade a wide variety of instruments and markets and typically do so by different methods, these managers are fairly heterogeneous as a group. Thus, global macro funds are not as consistently dependable as a source of short alpha when compared to pure systematic, trend-following managed futures funds that typically attempt to capture any significant market trend. But, as noted earlier, global macro managers tend to be more anticipatory (compared to managed futures managers), which can be a useful attribute.

6.1.1 Investment Characteristics

Global macro managers use fundamental and technical analysis to value markets, and they use discretionary and systematic modes of implementation. The view taken by global macro portfolio managers can be directional (e.g., buy bonds of banks expected to benefit from “normalization” of US interest rates) or thematic (e.g., buy the “winning” companies and short sell the “losing” companies from Brexit). Because of their heterogeneity, added due diligence and close attention to the current portfolio of a macro manager may be required by an allocator to correctly anticipate the factor risks that a given global macro manager will deliver.

Despite their heterogeneity, a common feature among most global macro managers is the use of leverage, often obtained through the use of derivatives, to magnify potential profits. A margin-to-equity ratio typically of 15% to 25% posted against futures or forward positions allows a manager to control face amounts of assets up to 6 to 7 times a fund’s assets. The use of such embedded leverage naturally allows the global macro manager ease and flexibility in relative value and directional positioning.

Generally, the key source of returns in global macro strategies revolves around correctly discerning and capitalizing on trends in global markets. As such, mean-reverting low volatility markets are the natural bane of this strategy area. Conversely, steep equity market sell-offs, interest rate regime changes, currency devaluations, volatility spikes, and geopolitical shocks caused by such events as trade wars and terrorism are examples of global macro risks; however, they can also provide some of the opportunities that global macro managers often attempt to exploit. Of course, the exposures selected in any global macro strategy may not react to the global risks as expected because of either unforeseen contrary factors or global risks that simply do not materialize. Thus, macro managers tend to produce somewhat lumpier and uneven return streams than other hedge fund strategies, and generally higher levels of volatility are associated with their returns.

Notably, the prevalence of quantitative easing since the global financial crisis of 2007–2009 resulted in generally benign market conditions for most of the subsequent decade, which was an especially imperfect environment for global macro managers. Although equity and fixed-income markets generally trended higher during this period, overall volatility levels across these and many other markets, such as currencies and commodities, were relatively low. In some cases, central bankers intervened to curtail undesirable market outcomes, thereby preventing certain global macro trends from fully materializing. Because such intervention substantially moderates the trendiness and the volatility of markets, which are the lifeblood of global macro strategies, some hedge fund allocators began avoiding these strategies. This may be shortsighted, however, because such opportunistic strategies as global macro can be very useful over a full market cycle in terms of portfolio diversification and alpha generation.

6.1.2 Strategy Implementation

Global macro strategies are typically top-down and employ a range of macroeconomic and fundamental models to express a view regarding the direction or relative value of an asset or asset class. Positions may comprise a mix of individual securities, baskets of securities, index futures, foreign exchange futures/forwards, precious or base metals futures, agricultural futures, fixed-income products or futures, and derivatives or

options on any of these. If the hedge fund manager is making a directional bet, then directional models will use fundamental data regarding a specific market or asset to determine if it is undervalued or overvalued relative to history and the expected macro trend. Conversely, if the manager's proclivity is toward relative value positioning, then that manager will consider which assets are under- or overvalued relative to each other given historical and expected macro conditions.

For example, if currencies of the major ASEAN block countries (i.e., Indonesia, Malaysia, Philippines, Singapore, and Thailand) are depreciating against the US dollar, a directional model might conclude that the shares of their key exporting companies are undervalued and thus should be purchased. However, further investigation might signal that the public bonds of these exporters are cheap relative to their shares, so the bonds should be bought and the shares sold short. This situation might occur in the likely scenario that the share prices react quickly to the currency depreciation and bond prices take longer to react to the trend.

Successful global macro trading requires the manager to have both a correct fundamental view of the selected market(s) and the proper methodology and timing to express tactical views. Managers who repeatedly implement a position too early/unwind one too late or who choose an inappropriate method for implementation will likely face redemptions from their investors. Given the natural leverage used in global macro strategies, managers may be tempted to carry many (possibly too many) positions simultaneously; however, the diversification benefits of doing so are typically less than those derived from more idiosyncratic long/short equity strategies. This is because of the nature of "risk-on" or "risk-off" market conditions (often caused by central bank policies) that impact a variety of asset classes in a correlated manner.

EXAMPLE 8

Global Macro Strategy

Consider the following (hypothetical) macroeconomic scenario: Emerging market (EM) countries have been growing rapidly (in fact, overheating) and accumulating both historically large government budget deficits and trade deficits as expanding populations demand more public services and foreign goods. EM central banks have been intervening to support their currencies for some time, and electoral support for candidates promoting exorbitant business taxes and vast social welfare schemes in many EM countries has risen dramatically. These trends are expected to continue.

Melvin Chu, portfolio manager at Bermuda-based Global Macro Advisers (GMA), has been considering how to position his global macro hedge fund. After meeting with a senior central banker of a leading EM country, GMA's research director informs Chu that it appears this central bank may run out of foreign exchange reserves soon and thus may be unable to continue its supportive currency intervention.

Discuss a global macro strategy Chu might implement to profit from these trends by using options.

Solution:

Assuming this key EM country runs out of foreign currency reserves, then it is likely its currency will need to be devalued. This initial devaluation might reasonably be expected to trigger a wave of devaluations and economic and financial market turbulence in other EM countries in similar circumstances. So, Chu should consider trades based on anticipated EM currency depreciation (maybe even devaluation) as well as trades benefitting from rising interest rates, downward pressure on equities, and spikes in volatility in the EM space.

A reasonable way for Chu to proceed would be to buy put options. If his expectations fail to materialize, his losses would then be capped at the total of the premiums paid for the options. Chu should consider buying puts on the following: a variety of EM currencies, EM government bond futures, and EM equity market indexes. He should buy in-the-money puts to implement his high conviction trades and out-of-the money puts for trades where he has a lower degree of confidence. Moreover, to take advantage of a possible flight-to-safety, Chu should consider buying call options on developed market (DM) reserve currencies as well as call options on bond futures for highly-rated DM government issuers.

6.2 Managed Futures

Managed futures, which gained its first major academic backing in a classic paper by John Lintner in 1983, is a hedge fund strategy that focuses on investments using futures, options on futures, and sometimes forwards and swaps (primarily on stock and fixed-income indexes) and commodities and currencies. As futures markets have evolved over time and in different countries—gaining in size (i.e., open interest) and liquidity—some managers have also engaged in trading sector and industry index futures as well as more exotic contracts, such as futures on weather (e.g., temperature, rainfall) and derivatives contracts on carbon emissions.

6.2.1 Investment Characteristics

The uncorrelated nature of managed futures with stocks and bonds generally makes them a potentially attractive addition to traditional portfolios for improved risk-adjusted return profiles (i.e., improved efficient frontiers in a mean–variance framework). The value added from managed futures has typically been demonstrated during periods of market stress; for example, in 2007–2009 managers using this strategy benefitted from short positions in equity futures and long positions in fixed-income futures at a time when equity indexes were falling and fixed-income indexes were rising. Put another way, managed futures demonstrated natural positive skewness that has been useful in balancing negatively-skewed strategies.

The return profile of managed futures tends to be very cyclical. Between 2011 and 2018, the trendiness (i.e., directionality) of foreign exchange and fixed-income markets deteriorated, volatility levels in many markets dissipated, and periods of acute market stress temporarily disappeared. Except for equity markets in some developed countries, many markets became range-bound or mean-reverting, which hurt managed futures performance. The diversification benefit of trend following strong equity markets is also (by definition) less diversifying to traditional portfolios than if such trends existed in other non-equity markets.

In a world where sovereign bonds have approached the zero-yield boundary, the correlation benefit of managed futures has also changed. The past practice of trend following the fixed-income markets as they get higher may likely not be as repeatable going forward. Assuming managed futures managers begin to trend follow fixed-income markets as they get lower (i.e., as developed market interest rates “normalize”), then positive returns may still be realized—although with a very different type of correlation behavior to equity markets (i.e., not as valuable). Also, given the upward sloping nature of most global yield curves, less natural fixed-income “carry” contribution may occur from trend following the fixed-income markets to the downside (i.e., higher interest rates and lower prices).

Managed futures strategies are typically characterized as highly liquid, active across a wide range of asset classes, and able to go long or short with relative ease. High liquidity results from futures markets being among the most actively traded

markets in the world. For example, the E-mini S&P 500 futures contract on the Chicago Mercantile Exchange has 3 to 4 times the daily dollar volume of the SPDR S&P 500 ETF (SPY), the world's most actively traded equity index fund. Futures contracts also provide highly liquid exposures to a wide range of asset classes that can be traded across the globe 24 hours a day. Because futures contracts require relatively little collateral to take positions as a result of the exchanges' central clearinghouse management of margin and risk, it is easier to take long and short positions with higher leverage than traditional instruments.

For example, futures contracts require margin from 0.1% to 10% of notional value for both long and short positions, as compared to standard equity market margin levels in the United States of 50%. Thus, the capital efficiency of futures contracts makes it easier for managed futures managers to be dynamic in both their long and short exposures. A traditional long-only portfolio is levered by borrowing funds to purchase additional assets. Futures portfolios do not own assets; they acquire asset exposures based on the notional value of the futures contracts held. The majority (typically 85% to 90%) of capital in a managed futures account is invested in short-term government debt (or other highly liquid collateral acceptable to the futures clearing house). The remainder (10% to 15%) is used to collateralize long and short futures contracts.

6.2.2 Strategy Implementation

Highly liquid contracts allow managed futures funds the flexibility to incorporate a wide range of investment strategies. Most managed futures strategies involve some "pattern recognition" trigger that is either momentum/trend driven or based on a volatility signal. Managers trade these signals across different time horizons, often with short-term mean reversion filters imposed on top of their core longer-term models. For example, a manager might have traded using a long-term horizon model that suggested gold prices would trend lower; as a result, the manager established a short position in gold futures some time ago. A short-term moving average of gold prices crossing below a longer-term moving average could have triggered this view. But later, that manager might also trade using a second, shorter time horizon model, which suggests that the downside momentum in gold prices has temporarily subsided and a mean-reverting bounce is likely. The results of these two models would be weighted and combined into an adjusted net position, typically with the longer-term model weighted more heavily than the shorter-term filter.

Such fundamental factors as carry relationships or volatility factors are often added to the core momentum and breakout signal methodologies, and they can be particularly useful regarding position sizing. Many managed futures managers implement their portfolios' relative position sizing by assessing both the volatility of each underlying futures position as well as the correlation of their return behaviors against one another. Generally, the greater the volatility of an asset, the smaller its portfolio sizing; and the greater its correlation to other futures being positioned, the smaller its portfolio sizing. Being attentive to correlation aspects between different futures contracts would then become a second step of analysis for most managed futures traders as a portfolio sizing risk constraint.

Besides core position sizing and sizing adjustments for volatility and correlation, managed futures managers will have either a price target exit methodology, a momentum reversal exit methodology, a time-based exit methodology, a trailing stop-loss exit methodology, or some combination thereof. A key to successful managed futures strategies is to have a consistent approach and to avoid overfitting of a model when backtesting performance across different markets and time periods. The goal is to have a model that performs well in a future "out of sample" period. Of course, trading models have a natural tendency to degrade in effectiveness over time as more and more managers use similar signals and the market opportunity being exploited consequently diminishes. Managed futures traders are thus constantly searching for new

and differentiated trading signals. In today's world, many new signals are increasingly being developed using nontraditional, unstructured data and other types of "big data" analysis.

Apart from this accelerating search for more unique nonprice signals, the most common type of managed futures approach is typically referred to as **time-series momentum** (TSM) trend following. Momentum trading strategies are driven by the past returns of the individual assets. Simply put, managers go long assets that are rising in price and go short assets that are falling in price. TSM strategies are traded on an absolute basis, meaning the manager can be net long or net short depending on the current price trend of an asset. Such TSM strategies work best when an asset's (or market's) own past returns are a good predictor of its future returns.

A second, less common approach is using **cross-sectional momentum** (CSM) strategies, which are implemented with a cross-section of assets (generally within an asset class) by going long those that are rising in price the most and by shorting those that are falling the most. Such CSM strategies generally result in holding a net zero or market-neutral position. CSM strategies work well when a market's out- or underperformance relative to other markets is a reliable predictor of its future performance. However, CSM may be constrained by limited futures contracts available for a cross section of assets at the asset class level.

Global macro strategies and managed futures strategies often involve trading the same subset of markets but in different ways. It is important to understand the respective attributes of these two strategies. Exhibit 9 provides such a comparison.

Exhibit 9 Managed Futures and Global Macro Strategies—Comparison of Risk, Liquidity, Leverage, and Benchmarking

Risk Profile and Liquidity

- Both global macro and managed futures strategies are highly liquid but with some crowding aspects and execution slippage in managed futures as AUM have grown rapidly. Being more heterogeneous in approaches used, global macro strategies face less significant execution crowding effects.
- Typically, managed futures managers tend to take a more systematic approach to implementation than global macro managers, who are generally more discretionary in their application of models and tools.
- Returns of managed futures strategies typically exhibit positive right-tail skewness in periods of market stress, which is very useful for portfolio diversification. Global macro strategies have delivered similar diversification in such stress periods but with more heterogeneous outcomes.
- Despite positive skewness, managed futures and global macro managers are somewhat cyclical and at the more volatile end of the spectrum of hedge fund strategies (with volatility positively related to the strategy's time horizon). In addition, macro managers can also be early and overly anticipatory in their positioning.

Leverage Usage

- High: High leverage is embedded in futures contracts. Notional amounts up to 6 to 7 times fund assets can be controlled with initial margin-to-equity of just 10%–20% (with individual futures margin levels being a function of the volatility of the underlying assets). Active use of options by many global macro managers adds natural elements of leverage and positive convexity.

(continued)

Exhibit 9 (Continued)**Benchmarking**

- Managed futures are best tracked by such sub-indexes as HFRX and HFRI Macro Systematic Indices; CISDM CTA Equal-Weighted Index; Lipper TASS Managed Futures Index; and Credit Suisse Managed Futures Index.
- Global macro strategies are best tracked by HFRX and HFRI Macro Discretionary Indices; CISDM Hedge Fund Global Macro Index; Lipper TASS Global Macro Index; and Credit Suisse Global Macro Index.

EXAMPLE 9**Cross-Sectional and Time-Series Momentum**

An institutional investor is considering adding an allocation to a managed futures strategy that focuses on medium-term momentum trading involving precious metals. This investor is evaluating two different managed futures funds that both trade precious metals futures, including gold, silver, platinum, and palladium futures. Of the two funds being considered, one is run using a cross-sectional momentum (CSM) strategy, and the other is managed using a time-series momentum (TSM) strategy. Both funds use trailing 6-month returns for developing their buy/sell signals, and they both volatility-weight their futures positions to have equal impact on their overall portfolios.

Explain how the CSM and TSM strategies would work and compare their risk profiles.

Solution:

For the CSM strategy, each day the manager will examine the returns for the four metals in question and then take a long position in the two metals futures with the best performance (i.e., the top 50%) in terms of trailing 6-month risk-adjusted returns and a short position in the two metals contracts with the worst performance (i.e., the bottom 50%) of returns. According to this strategy, the top (bottom) 50% will continue their relative value out- (under-) performance. Note that it is possible for metals contracts (or markets more generally) in the top (bottom) 50% to have negative (positive) absolute returns—for example, during bear (bull) markets. The CSM strategy is very much a relative momentum strategy, with the established positions acting as a quasi-hedge relative to each other in terms of total sector exposure. This CSM-run fund would likely deliver an overall return profile with somewhat less volatility than the TSM strategy.

For the TSM strategy, each day the manager will take a long position in the precious metals futures with positive trailing 6-month returns and sell short those metals contracts with negative trailing 6-month returns. According to this TSM strategy, the metals futures (or markets, more generally) with positive (negative) returns will continue to rise (fall) in absolute value, resulting in an expected profit on both long and short positions. However, by utilizing a TSM strategy, the fund might potentially end up with long positions in all four metals contracts or short positions in all these precious metals futures at the same time.

Consequently, the CSM strategy typically results in a net zero market exposure during normal periods, while the TSM strategy can be net long or net short depending on how many metal (or markets, generally) have positive and negative absolute returns. The return profile of the TSM managed fund is

thus likely to be more volatile than that of the CSM managed fund and also far more sensitive to periods when the precious metals sector is experiencing strong trends (i.e., directionality).

SPECIALIST STRATEGIES

7

Specialist hedge fund strategies require highly specialized skill sets for trading in niche markets. Two such typical specialist strategies are volatility trading and reinsurance/life settlements.

7.1 Volatility Trading

Over the past several decades, volatility trading has become an asset class unto itself. Niche hedge fund managers specialize in trading relative volatility strategies globally across different geographies and asset classes. For example, given the plethora of structured product offerings in Asia with inexpensive embedded options that can be stripped out and resold (usually by investment banks), volatility pricing in Asia is often relatively cheap compared to the more expensive implied volatility of options traded in North American and European markets. In these latter markets, there is a proclivity to buy out-of-the-money options as a protective hedge (i.e., insurance). The goal of **relative value volatility arbitrage** strategies is to source and buy cheap volatility and sell more expensive volatility while netting out the time decay aspects normally associated with options portfolios. Depending on the instruments used (e.g., puts and calls or variance swaps), these strategies may also attempt to extract value from active gamma trading adjustments when markets move.

7.1.1 Investment Characteristics and Strategy Implementation

The easiest way to understand relative value volatility trading is through a few examples. Throughout the 1980s and 1990s, options on the Japanese yen consistently traded at lower volatility levels within Asian time zones than similar options were traded in London, New York, or Chicago (i.e., IMM futures market). Capturing the volatility spread between these options is a type of relative value volatility trading known as time-zone arbitrage—in this case of a single underlying fungible global asset, the Japanese yen. As a second arbitrage example, managers in today's markets may periodically source Nikkei 225 implied volatility in Asia at cheaper levels than S&P 500 implied volatility is being traded in New York, even though the Nikkei 225 typically has realized volatility higher than that of the S&P 500. This type of relative value volatility trading is known as cross-asset volatility trading, which may often involve idiosyncratic, macro-oriented risks.

Of course, another simpler type of volatility trading involves outright long volatility traders who may trade against consistent volatility sellers. Equity volatility is approximately 80% *negatively* correlated with equity market returns. Otherwise stated, volatility levels tend to go up when equity markets fall, with options pricing skew reflecting such a tendency. Clearly, this makes the long volatility strategy a useful potential diversifier for long equity investments, albeit at the cost to the option premium paid by the volatility buyer. Selling volatility provides a volatility risk premium or compensation for taking on the risk of providing insurance against crises for holders of equities and other securities.

In the United States, the most liquid volatility contracts are short-term VIX Index futures contracts, which track the 30-day implied volatility of S&P 500 Index options as traded on the Chicago Board Options Exchange (CBOE). Because volatility is

non-constant but high levels of volatility are difficult to perpetuate over long periods of time (markets eventually calm down after sudden jump shifts), VIX futures are often prone to mean reversion. Given this fact and the fact that VIX futures prices typically slide down a positively sloped implied volatility curve as expiration approaches, many practitioners prefer trading simple exchange-traded options, over-the-counter (OTC) options, variance swaps, and volatility swaps. The general mean-reverting nature of volatility still impacts these products, but it does so in a less explicit fashion than with the futures.

Multiple paths can be taken to implement a volatility trading strategy. If a trader uses simple exchange-traded options, then the maturity of such options typically extends out to no more than approximately two years. In terms of expiry, the longer-dated options will have more absolute exposure to volatility levels (i.e., vega exposure) than shorter-dated options, but the shorter-dated options will exhibit more delta sensitivity to price changes (i.e., gamma exposure). Traders need to monitor the following: the term structure of volatility, which is typically upward sloping but can invert during periods of crisis; the volatility smile across different strike prices, whereby out-of-the-money options will typically trade at higher implied volatility levels than at-the-money options; and the volatility skew, whereby out-of-the-money puts may trade at higher volatility levels than out-of-the-money calls. Volatility traders strive to capture relative timing and strike pricing opportunities using various types of option spreads, such as bull and bear spreads, straddles, and calendar spreads.

To extract an outright long volatility view, options are purchased and delta hedging of the gamma exposure is required. How the embedded gamma of the long options position is managed is also important. For example, one could have a positive view of a volatility expansion but then fail to capture gains in a volatility spike during an adverse market move by poorly managing gamma exposure. Conversely, some managers may use options to extract a more intermediate-term, directional insurance protection-type view of both price and volatility and not engage in active delta hedging.

A second, similar path might be to implement the volatility trading strategy using OTC options. Then the tenor and strike prices of the options can be customized, and the tenor of expiry dates can be extended beyond what is available with exchange-traded options. However, by utilizing OTC options, the strategy is subject to counterparty credit risk as well as added illiquidity risk.

Migrating to the use of VIX Index futures (or options on VIX futures) can more explicitly express a pure volatility view without the need for constant delta hedging of an equity put or call for isolating the volatility exposure. However, as just mentioned, volatility pricing tends to be notoriously mean reverting. Also, an abundant supply of traders and investors typically are looking to sell volatility to capture the volatility premium and the volatility roll down payoff. Roll down refers to the fact that the term structure of volatility tends to be positively sloped, so the passage of time causes added option price decay. In other words, the theta of a long option position is always negative, and if shorter-dated options have a lower implied volatility, then the passage of time increases the rate of natural theta decay.

A fourth path for implementing a volatility trading strategy would be to purchase an OTC volatility swap or a variance swap from a creditworthy counterparty. A volatility swap is a forward contract on future realized price volatility. Similarly, a variance swap is a forward contract on future realized price variance, where variance is the square of volatility. In both cases, at inception of the trade the strike is typically chosen such that the fair value of the swap is zero. This strike is then referred to as fair volatility or fair variance, respectively. At expiry of the swaps, the receiver of the floating leg pays the difference between the realized volatility (or variance) and the agreed-on strike times some prespecified notional amount that is not initially exchanged. Both volatility and variance swaps provide “pure” exposure to volatility alone—unlike standardized options in which the volatility exposure depends on the price of the underlying asset

and must be isolated and extracted via delta hedging. These swaps can thus be used to take a view on future realized volatility, to trade the spread between realized and implied volatility, or to hedge the volatility exposure of other positions. These OTC products also offer the advantage of longer-dated, tailored maturities and strikes.

A long volatility strategy utilizing OTC volatility or variance swaps, options, or swaptions requires finding undervalued instruments. This is accomplished by being in frequent contact with options dealers around the world in a variety of asset classes. Once implemented, positions are held until they are either exercised, sold during a volatility event, actively delta hedged (in the case of a long options position), or expire. A long volatility strategy is a convex strategy because the movement of volatility pricing is typically asymmetric and skewed to the right. Also, strike prices of options may be set such that the cost of the options is small, but their potential payoffs are often many multiples of the premiums paid for the options.

Long volatility strategies are potentially attractive but also come with key challenges and risks for implementation. Given that OTC options, as well as volatility and variance swaps, are not exchange-traded, they must be negotiated. These contracts are typically structured under ISDA documentation; they are subject to bilateral margin agreements (as negotiated within an ISDA Credit Support Annex document), but they still carry more counterparty risk and liquidity risk to both establish and liquidate than instruments traded on an exchange. Also, smaller hedge funds may not even be able to access ISDA-backed OTC derivatives with banking counterparts until surpassing a minimum AUM threshold, generally \$100 million. Above all, although the purchase of volatility assets provides positively convex outcomes, it almost always involves some volatility curve roll down risk and premium expense. Key aspects of volatility trading are presented in Exhibit 10.

Exhibit 10 Volatility Trading Strategies—Risk, Liquidity, Leverage, and Benchmarking

Risk Profile and Liquidity

- Long volatility positioning exhibits positive convexity, which can be particularly useful for hedging purposes. On the short side, option premium sellers generally extract steadier returns in normal market environments.
- Relative value volatility trading may be a useful source of portfolio return alpha across different geographies and asset classes.
- Liquidity varies across the different instruments used for implementation. VIX Index futures and options are very liquid; exchange-traded index options are generally liquid, but with the longest tenors of about two years (with liquidity decreasing as tenor increases); OTC contracts can be customized with longer maturities but are less liquid and less fungible between different counterparties.

Leverage Usage

- The natural convexity of volatility instruments typically means that out-sized gains may be earned at times with very little up-front risk. Although notional values appear nominally levered, the asymmetric nature of long optionality is an attractive aspect of this strategy.

Benchmarking

- Volatility trading is a niche strategy that is difficult to benchmark.

(continued)

Exhibit 10 (Continued)

- CBOE Eurekahedge has the following indexes:

Long (and Short) Volatility Index, composed of 11 managers with a generally long (short) volatility stance; Relative Value Volatility Index (composed of 35 managers); and Tail Risk Index (composed of 8 managers), designed to perform best during periods of market stress.

EXAMPLE 10**Long Volatility Strategy Payoff**

Consider the following scenario: Economic growth has been good, equity markets have been rising, and interest rates have been low. However, consumer debt (e.g., subprime mortgages, credit card debt, personal loans) has been rising rapidly, surpassing historic levels. In mid-January, Serena Ortiz, a long volatility hedge fund manager, purchased a basket of long-dated (one-year), 10% out-of-the-money put options on a major stock index for \$100 per contract at an implied volatility level of 12%.

As of mid-April, consumer debt is still at seemingly dangerous levels and financial markets appear ripe for a major correction. However, the stock index has risen another 20% above its mid-January levels, and volatility is low. So, Ortiz's options are priced even more cheaply than before, at \$50 per contract.

Now jump forward in time by another three months to mid-July, when a crisis—unexpected by many participants—has finally occurred. Volatility has spiked, and the stock index has fallen to 25% below its April level and 10% below its starting January level. Ortiz's put options are now trading at an implied volatility pricing of 30%.

- 1 Discuss the time, volatility, and price impact on Ortiz's long volatility exposure in put options as of mid-July.
- 2 Discuss what happens if the market subsequently moves broadly sideways between July and the January of the next year.

Solution to 1:

Despite an initial 50% mark-to-market loss on her put exposure as of mid-April, Ortiz likely has substantial unrealized profits by mid-July. As six months passed (other things being equal), Ortiz would have suffered some time decay loss in her long put position, but her options have also gone from being 10% out-of-the-money to now being at-the-money. Implied volatility has increased 2.5 times (from 12% to 30%), which on a six-month, at-the-money put will have a significant positive impact on the option's pricing (the closer an option is to being at-the-money, the greater the impact that changes in implied volatility will have on its price). So, as of mid-July, Ortiz will likely have a significant mark-to-market gain.

Solution to 2:

If the market subsequently moves broadly sideways until January of the next year, Ortiz's at-the-money option premium will slowly erode because of time decay. Assuming the puts remain at-the-money, their volatility value will eventually dissipate; Ortiz will ultimately lose all of her original \$100 investment per contract unless she has nimbly traded against the position with active delta hedging.

of the underlying stock index futures. This would entail buying and selling the index futures over time to capture small profitable movements to offset the time decay and volatility erosion in the puts.

7.2 Reinsurance/Life Settlements

Although still somewhat nascent, hedge funds have also entered the world of insurance, reinsurance, life settlements, and catastrophe reinsurance. Underlying insurance contracts provide a payout to the policyholder (or their beneficiaries) on the occurrence of a specific insured event in exchange for a stream of cash flows (periodic premiums) paid by the policyholder. Common types of insurance contracts sold by insurance providers include vehicle and home insurance, life insurance, and catastrophe insurance, which covers damage from such events as floods, hurricanes, or earthquakes. The insurance market encompasses a wide range of often highly specific and detailed contracts that are less standardized than other financial contracts. As a result, insurance contracts are generally not liquid and are difficult to sell or purchase after contract initiation.

Although the primary market for insurance has existed for centuries, the secondary market for insurance has grown substantially in the last several decades. Individuals who purchased whole or universal life policies and who no longer want or need the insurance can surrender their policies to the original insurance issuer. However, such policyholders are increasingly finding that higher cash values (i.e., significantly above surrender value) are being paid for their policies by third-party brokers, who, in turn, offer these policies as investments to hedge funds. Hedge funds may formulate a differentiated view of individual or group life expectancy; if correct, investment in such life policies can provide attractive uncorrelated returns.

Reinsurance of catastrophe risk has also increasingly attracted hedge fund capital. These new secondary markets have improved liquidity and enhanced the value of existing insurance contracts. For insurance companies, the reinsurance market allows for risk transfer, capital management, and solvency management. For hedge funds, the reinsurance market offers a source of uncorrelated return alpha.

7.2.1 *Investment Characteristics and Strategy Implementation*

Life insurance protects the policyholder's dependents in the case of his/her death. The secondary market for life insurance involves the sale of a life insurance contract to a third party—a **life settlement**. The valuation of a life settlement typically requires detailed biometric analysis of the individual policyholder and an understanding of actuarial analysis. So, a hedge fund manager specialized in investing in life settlements would require such expert knowledge and skills or would need to source such knowledge from a trusted partner/actuarial adviser.

A hedge fund strategy focusing on life settlements involves analyzing pools of life insurance contracts being offered for sale, typically being sold by a third-party broker who purchased the insurance contracts from the original policyholders. The hedge fund would look for the following policy characteristics: 1) the surrender value being offered to an insured individual is relatively low; 2) the ongoing premium payments to keep the policy active are also relatively low; and, yet, 3) the probability is relatively high that the designated insured person is indeed likely to die within a certain period of time (i.e., earlier than predicted by standard actuarial methods).

On finding the appropriate policy (or, more typically, a pool of policies), the hedge fund manager pays a lump sum (via a broker) to the policyholder(s), who transfers the right to the eventual policy benefit to the hedge fund. The hedge fund is then responsible for making ongoing premium payments on the policy in return for receiving the future death benefit. This strategy is successful when the present value of the future benefit payment received by the hedge fund exceeds the present value of intervening

payments made by the hedge fund. The two key inputs in the hedge fund manager's analysis are the expected policy cash flows (i.e., up-front, lump-sum payment to buy the policy; ongoing premium payments to the insurance company; and the eventual death benefit to be received) and the time to mortality. Neither of these factors has anything to do with the overall behavior of financial markets. Thus, this strategy area is unrelated and uncorrelated with other hedge fund strategies.

Catastrophe insurance protects the policyholder in case of such events as floods, hurricanes, and earthquakes, which are highly idiosyncratic and also unrelated and uncorrelated with financial market behavior. Insurance companies effectively reinsure portions of their exposure (typically above a given threshold and for a limited amount) with reinsurance companies, who, in turn, deal with hedge funds as a source of capital. An attractive and uncorrelated return profile may be achieved if by making such reinsurance investments a hedge fund can do the following: 1) obtain sufficient policy diversity in terms of geographic exposure and type of insurance being offered; 2) receive a sufficient buffer in terms of loan loss reserves from the insurance company; and 3) receive enough premium income.

Valuation methods for catastrophe insurance may require the hedge fund manager to consider global weather patterns and make forecasts using sophisticated prediction models that involve a wide range of geophysical inputs. But, more generally, assumptions are made as to typical weather patterns; the worst-case loss potentials are made from different reinsurance structures. These assumptions are then weighed against the reinsurance income to be received. If a catastrophic event does occur, then hedge fund managers hope to have enough geographic diversity that they are not financially harmed by a single event, thereby continuing to benefit when insurance premiums are inevitably increased to cover future catastrophic events.

Organized markets for catastrophe bonds and catastrophe risk futures continue to develop. These bonds and financial futures can be used to take long positions or to hedge catastrophe risk in a portfolio of insurance contracts. Their issuance and performance tend to be seasonal. Many such catastrophe bonds are issued before the annual North American hurricane season begins (May/June) and may perform particularly well if a given hurricane season is benign.

EXAMPLE 11

Investing in Life Settlements

Mikki Tan runs specialty hedge fund SingStar Pte. Ltd. (SingStar), based in Singapore, that focuses on life settlements. SingStar is staffed with biometric and actuarial science experts who perform valuation analysis on pools of life insurance policies offered for sale by insurance broker firms. These intermediaries buy the policies from individuals who no longer need the insurance and who want an up-front cash payment that is higher than the surrender value offered by their insurance companies.

Tan knows that Warwick Direct has been buying many individuals' life insurance policies that were underwritten by NextLife, an insurance company with a reputation in industry circles for relatively weak underwriting procedures (i.e., charging low premiums for insuring its many relatively unhealthy policyholders) and for paying low surrender values. Tan is notified that Warwick Direct is selling a pool of life settlements heavily weighted with policies that were originated by NextLife. Parties wishing to bid will be provided with data covering a random sample of the life insurance policies in the pool.

Tan asks SingStar's experts to analyze the data, and they report that many of the policies in the pool were written on individuals who have now developed early-onset Alzheimer's and other debilitating diseases and thus required the

up-front cash for assisted living facilities and other special care. Moreover, the analysts indicate that early-onset Alzheimer's patients have a life expectancy, on average, that is 10 years shorter than persons without the disease.

Discuss how Tan and SingStar's team might proceed given this potential investment.

Solution:

SingStar's financial, biometric, and actuarial experts need to work together to forecast expected cash flows from this potential investment and then value it using an appropriate risk-adjusted discount rate. The cash flows would include the following:

- The ongoing premium payments that SingStar would need to make to the originating insurance companies (in this case, mainly to NextLife) to keep the policies active. The low premiums NextLife is known to charge as well as the shorter average life expectancy of many individuals represented in the pool are important factors to consider in making this forecast.
- The timing of future benefit payments to be received by SingStar on the demise of the individuals (the formerly insured). The prevalence of early-onset Alzheimer's disease and other debilitating diseases as well as the shorter average life expectancy of many individuals in the pool are key factors to consider in formulating this forecast.

Once an appropriate discount rate is decided on—one that compensates for the risks of the investment—then its present value can be determined. The difference between the PV and any minimum bid price set by Warwick Direct, as well as Tan's perceptions of the competition in bidding, will determine Tan's proposed purchase price. If SingStar ultimately buys the pool of life settlement policies and the forecasts (e.g., biometric, actuarial, and financial) of Tan's team are met or exceeded, then this investment should yield attractive returns to SingStar that are uncorrelated to other financial markets.

MULTI-MANAGER STRATEGIES

8

The previous sections examined individual hedge fund strategies. In practice, most investors invest in a range of hedge fund strategies. Three main approaches are used to combine individual hedge fund strategies into a portfolio: 1) *creating one's own mix of managers* by investing directly into individual hedge funds running different strategies; 2) *fund-of-funds*, which involves investing in a single fund-of-funds manager who then allocates across a set of individual hedge fund managers running different strategies; and 3) *multi-strategy funds*, which entails investing in a single fund that includes multiple internal management teams running different strategies under the same roof. Of course, approaches (1) and (2) are not specific to combinations of strategies; they apply to individual strategies too.

8.1 Fund-of-Funds

Fund-of-funds (FoF) managers aggregate investors' capital and allocate it to a portfolio of separate, individual hedge funds following different, less correlated strategies. The main roles of the FoF manager are to provide diversification across hedge fund strategies; to make occasional tactical, sector-based reallocation decisions; to engage in underlying manager selection and due diligence; and to perform ongoing portfolio

management, risk assessment, and consolidated reporting. FoF managers can provide investors with access to certain closed hedge funds, economies of scale for monitoring, currency hedging capabilities, the ability to obtain and manage leverage at the portfolio level, and such other practical advantages as better liquidity terms than would be offered by an individual hedge fund manager.

Disadvantages of the FoF approach include a double layer of fees the investor must pay; a lack of transparency into individual hedge fund manager processes and returns; the inability to net performance fees on individual managers; and an additional principal-agent relationship. Regarding fees, in addition to management and incentive fees charged by the individual hedge funds (with historical norms of 1%–2% and 10%–20%, respectively) in which the FoF invests, investors in a fund-of-funds historically paid an additional 1% management fee and 10% incentive fee (again, historical norms) on the performance of the total FoF portfolio. As the performance of funds of funds has generally waned, fees have become more negotiable; management fees of 50 bps and incentive fees of 5% (or simply just a 1% flat total management fee) are becoming increasingly prevalent.

Occasionally, liquidity management of FoF can result in liquidity squeezes for FoF managers. Most FoFs require an initial one-year lock-up period, and then they offer investors monthly or quarterly liquidity thereafter, typically with a 30- to 60-day redemption notice also being required. However, the underlying investments made by the FoF may not fit well with such liquidity needs. Some underlying managers or newer underlying investments may have their own lock-up provisions or liquidity (i.e., redemption) gates. So, the FoF manager must stagger his/her underlying portfolio investments to create a conservative liquidity profile while carefully assessing the probability and potential magnitude of any FoF-level redemptions that he/she might face. FoFs may also arrange a reserve line of credit as an added liquidity backstop to deal with the potential mismatch between cash flows available from underlying investments and cash flows required to meet redemptions.

8.1.1 *Investment Characteristics*

FoFs are important hedge fund “access vehicles” for smaller high-net-worth investors and smaller institutions. Most hedge funds require minimum initial investments that range from \$500,000 to \$5,000,000 (with \$1,000,000 being the most typical threshold). To create a reasonably diversified portfolio of 15–20 managers, \$15–20 million would be required, which is a large amount even for most wealthy families and many small institutions. Selecting the 15–20 different hedge fund managers would itself require substantial time and resources that most such investors may lack. In addition, investors may potentially face substantial tax reporting requirements for each separate hedge fund investment owned. By comparison, a high-net-worth investor or small institution can typically start FoF investments with just \$100,000, effectively achieving a portfolio that includes a diversified mix of talented hedge fund managers. Through their network of relationships and their large scale, FoFs may also provide access to successful managers whose funds are otherwise closed to new investment. Overall, FoFs may thus be considered convenient for access, diversification, liquidity, and operational tax reporting reasons.

But FoFs are also designed to provide other attractive features, even for such institutional investors as endowments, foundations, and pension plans. Such institutional clients may initially turn to FoFs as their preferred path to navigate their way into the hedge fund space. FoFs offer expertise not only in individual manager selection and due diligence but also in strategic allocation, tactical allocation, and style allocation into individual hedge fund strategies. The FoF strategic allocation is the long-term allocation to different hedge fund styles. For example, a FoF may have a strategic allocation of 20% to long/short equity strategies, 30% to event-driven strategies, 30% to relative value strategies, and 20% to global macro strategies. Tactical allocations

include periodically overweighting and underweighting different hedge fund styles across different market environments depending on the level of conviction of the FoF manager. The overall capital or risk exposure can also be geared up or down to reflect the opportunity set in different market conditions.

Through their prime brokerage services, commercial banks provide levered capital to FoFs. Such leverage is typically collateralized by the existing hedge fund assets held in custody by these banks. Because hedge funds often deliver full funds back to redeeming investors with some substantial time lag (a 10% holdback of the total redemption amount until audit completion is typical), access to leverage can often be useful from a bridge loan point of view. In this way, capital not yet returned can be efficiently redeployed for the benefit of remaining investors.

Another attractive aspect of larger FoFs is that by pooling smaller investor assets into a larger single investment commitment, the FoF may be able to extract certain fee breaks, improved liquidity terms, future capacity rights, and/or added transparency provisions from an underlying hedge fund. The FoF may also be able to secure a commitment from the underlying fund to receive the best terms that might subsequently be offered to any future investor. These can all be valuable concessions that a smaller investor would most likely be unable to obtain by investing directly. Some FoFs have argued that these concessions made at the underlying fund manager level can be worth more than the added layering of fees by the FoF.

Overall, by combining different and ideally less correlated strategies, a FoF portfolio should provide more diversification, less extreme risk exposures, lower realized volatility, and generally less single manager tail risk than direct investing in individual hedge fund strategies. FoFs may also achieve economies of scale, manager access, research expertise, potential liquidity efficiencies, useful portfolio leverage opportunities, and potentially valuable concessions from the underlying funds.

8.1.2 Strategy Implementation

Implementing a FoF portfolio is typically a multi-step process that transpires over several months. First, FoF managers will become acquainted with different hedge fund managers via the use of various databases and introductions at prime broker-sponsored capital introduction events, where hedge fund managers present their perceived opportunity sets and qualifications to potential investors. Then, the FoF manager must decide the desired strategic allocation of the portfolio across the different hedge fund strategy groupings.

Next, with both quantitative and qualitative top-down and bottom-up approaches, the formal manager selection process is initiated. For each strategy grouping, the FoF manager screens the available universe of hedge funds with the goal to formulate a select “peer group” of potential investment candidates. This is followed by direct interviews of each hedge fund manager as well as a review of their relevant materials, such as presentation booklets, Alternative Investment Management Association Due Diligence Questionnaires (AIMA DDQs), recent quarterly letters and risk reports, as well as past audits. Typically, FoF managers will meet with prospective hedge fund managers on several different occasions (with at least one onsite visit at their offices). FoF managers will have an increasingly granular focus not only on the hedge fund managers’ investment philosophy and portfolio construction but also on the firms’ personnel, operational, and risk management processes.

Once an individual hedge fund is deemed a true candidate for investment, the fund’s Offering Memorandum and Limited Partnership Agreement will be fully reviewed. The fund’s service providers (e.g., auditor, legal adviser, custodian bank, prime broker) will be verified and other background checks and references obtained. At some larger FoF firms, these more operational aspects of the due diligence process will be performed by a dedicated team of specialists who validate the original FoF team’s investment conclusions or cite concerns that may need to be addressed prior to an allocation. At

this point, the FoF manager may endeavor to obtain certain concessions, agreed to in “side letters,” from the hedge fund manager entitling the FoF to reduced fees, added transparency provisions, capacity rights to build an investment in the future, and/or improved redemption liquidity provisions. The larger the potential investment, the greater the FoF’s negotiation advantage.

After a hedge fund is approved and the strategy is included in the FoF portfolio, then the process moves into the ongoing monitoring and review phases. The main concerns are monitoring for performance consistency with investment objectives and for any style drift, personnel changes, regulatory issues, or other correlation/return shifts that may transpire when compared to other managers both within the portfolio and when compared to similar hedge fund peers.

8.2 Multi-Strategy Hedge Funds

Multi-strategy hedge funds combine multiple hedge fund strategies under the same hedge fund structure. Teams of managers dedicated to running different hedge fund strategies share operational and risk management systems under the same roof.

8.2.1 *Investment Characteristics*

A key advantage to this approach is that the multi-strategy manager can reallocate capital into different strategy areas more quickly and efficiently than would be possible by the FoF manager. The multi-strategy manager has full transparency and a better picture of the interactions of the different teams’ portfolio risks than would ever be possible for the FoF manager to achieve. Consequently, the multi-strategy manager can react faster to different real-time market impacts—for example, by rapidly increasing or decreasing leverage within different strategies depending on the perceived riskiness of available opportunities. Teams within a multi-strategy manager also can be fully focused on their respective portfolios because the business, operational, and regulatory aspects of running the hedge fund are handled by other administrative professionals. Many talented portfolio managers decide to join a multi-strategy firm for this reason.

The fees paid by investors in a multi-strategy fund can be structured in many ways, some of which can be very attractive when compared to the FoF added fee layering and netting risk attributes. Conceptually, the FoF investor always faces netting risk, whereby he/she is responsible for paying performance (i.e., incentive) fees due to winning underlying funds while suffering return drag from the performance of losing underlying funds. Even if the FoF’s overall performance (aggregated across all funds) is flat or down, FoF investors must still pay incentive fees due to the managers of the winning underlying funds.

The fee structure is more investor-friendly at multi-strategy hedge funds where the general partner absorbs the netting risk arising from the divergent performances of his/her fund’s different strategy teams. This is an attractive outcome for the multi-strategy fund investor because 1) the GP is responsible for netting risk; and 2) the only investor-level incentive fees paid are those due on the total fund performance after netting the positive and negative performances of the various strategy teams. Although beneficial to investors, this structure can at times cause discord within a multi-strategy fund. Because the GP is responsible for netting risk, the multi-strategy fund’s overall bonus pool may shrink; thus, high-performing strategy teams will be disaffected if they do not receive their full incentive amounts, which ultimately results in personnel losses.

However, some multi-strategy hedge fund firms operate with a “pass-through” fee model. Using this model, they may charge no management fee but instead pass through the costs of paying individual teams (inclusive of salary and incentive fees earned by each team) before an added manager level incentive fee is charged to the investor on total fund performance. In this instance, the investor does implicitly pay

for a portion of netting risk between the different teams (in place of a management fee), while the multi-strategy fund's GP bears a portion of that netting risk (via the risk that the total fund-level incentive fee may not cover contractual obligations that the GP is required to pay individual teams).

The main risk of multi-strategy funds is that they are generally quite levered: Position transparency is closely monitored in-house, and fee structures are typically tilted toward performance (due to high costs of the infrastructure requirements). Leverage applied to tight risk management is usually benign, but in market stress periods, risk management miscalibrations can certainly matter. The left-tail, risk-induced implosions of prominent multi-strategy funds, such as Ritchie Capital (2005) and Amaranth Advisors (2006), are somewhat legendary. Moreover, the operational risks of a multi-strategy firm, by definition, are not well diversified because all operational processes are performed under the same fund structure. Finally, multi-strategy funds can be somewhat limited in the scope of strategies offered because they are constrained by the available pool of in-house manager talent and skills (and are often staffed by managers with similar investment styles and philosophies).

8.2.2 Strategy Implementation

Multi-strategy funds invest in a range of individual hedge fund strategies. As mentioned, the breadth of strategies they can access is a function of the portfolio management skills available within the particular multi-strategy fund. Similar to a FoF manager, a multi-strategy fund will engage in both strategic and tactical allocations to individual hedge fund strategies. Given that multi-strategy fund teams manage each strategy directly and operate under the same fund roof, compared FoF managers, they are more likely to be well informed about when to tactically reallocate to a particular strategy and more capable of shifting capital between strategies quickly. Conversely, multi-strategy funds may also be less willing to exit strategies in which core expertise is in-house. Common risk management systems and processes are also more likely to reveal interactions and correlations between the different strategies run by the various portfolio management teams. Such nuanced aspects of risk might be far harder to detect within a FoF structure.

Exhibit 11 compares some key attributes of fund-of-funds and multi-strategy funds that investors must consider when deciding which of these two multi-manager types best fits their needs.

Exhibit 11 Fund-of-Funds and Multi-Strategy Funds—Comparison of Risk, Liquidity, Leverage, and Benchmarking

Risk Profile and Liquidity

- FoF and multi-strategy funds are designed to offer steady, low-volatility returns via their strategy diversification. Multi-strategy funds have generally outperformed FoFs but with more variance and occasional large losses often related to their higher leverage.
- Multi-strategy funds offer potentially faster tactical asset allocation and improved fee structure (netting risk handled at strategy level) but with higher manager-specific operational risks. FoFs offer a potentially more diverse strategy mix but with less transparency and slower tactical reaction time.
- Both groups typically have similar initial lock-up and redemption periods, but multi-strategy funds also often impose investor-level or fund-level gates on maximum redemptions allowed per quarter.

(continued)

Exhibit 11 (Continued)**Leverage Usage**

- Multi-strategy funds tend to use significantly more leverage than most FoFs, which gravitate to modest leverage usage. Thus, multi-strategy funds are somewhat more prone to left-tail blow-up risk in stress periods. Still, better strategy transparency and shorter tactical reaction time make multi-strategy funds overall more resilient than FoFs in preserving capital.

Benchmarking

- FoFs can be tracked using such sub-indexes as HFRX and HFRI Fund of Funds Composite Indices; Lipper/TASS Fund-of-Funds Index; CISDM Fund-of-Funds Multi-Strategy Index; and the broad Credit Suisse Hedge Fund Index as a general proxy for a diversified pool of managers.
- Multi-strategy managers can be tracked via HFRX and HFRI Multi-Strategy Indices; Lipper/TASS Multi-Strategy Index; CISDM Multi-Strategy Index; and CS Multi-Strategy Hedge Fund Index.

Note: The FoF business model has been under significant pressure since 2008 because of fee compression and increased investor interest in passive, long-only investing and the advent of liquid alternatives for retail investors. Conversely, multi-strategy funds have grown as many institutional investors prefer to invest directly in such funds and avoid FoF fee layering.

EXAMPLE 12**Fund-of-Funds: Net-of-Fee Returns**

Squaw Valley Fund of Funds (SVFOF) charges a 1% management fee and 10% incentive fee and invests an equal amount of its assets into two individual hedge funds: Pyrenees Fund (PF) and Ural Fund (UF), each charging a 2% management fee and a 20% incentive fee. For simplicity in answering the following questions, please ignore fee compounding and assume that all fees are paid at year-end.

- 1 If the managers of both PF and UF generate 20% gross annual returns, what is the net-of-fee return for an investor in SVFOF?
- 2 If PF's manager earns a gross return of 20% but UF's manager loses 5%, what is the net-of-fee return for an investor in SVFOF?

Solution to 1:

Incentive fees are deducted only from gross gains net of management fees and expenses. Thus, the answer becomes:

Net of Fees Return for PF and UF Investor = $(20\% - 2\% - 3.6\%) = 14.4\%$,
where $3.6\% = 20\% \times (20\% - 2\%)$;

Net of Fees Return for SVFOF Investor = $(14.4\% - 1\% - 1.34\%) = 12.06\%$,
where $1.34\% = 10\% \times (14.4\% - 1\%)$.

Solution to 2:

Net of Fees Return for PF Investor = $(20\% - 2\% - 3.6\%) = 14.4\%$;

Net of Fees Return for UF Investor = $(-5\% - 2\% - 0\%) = -7.0\%$;

Gross Return for SVFOF Investor = $(0.5 \times 14.4\% + 0.5 \times -7.0\%) = 3.7\%$;

Net of Fees Return for SVFOF Investor = $(3.7\% - 1\% - 0.27\%) = 2.43\%$,
where $0.27\% = 10\% \times (3.7\% - 1\%)$.

In conclusion, if both PF and UF managers generate gross returns of 20%, then the net-of-fee return for SVFOF's investor is 12.06%, with fees taking up 39.7% of the total gross investment return $[(2\% + 3.6\% + 1\% + 1.34\%)/20\% = 39.7\%]$ and the remainder going to the SVFOF investor.

But, if PF's manager earns a 20% gross return and UF's manager loses 5%, then the net-of-fee return for the SVFOF investor is a meager 2.43%. In this case, most (67.6%) of the original gross return of 7.5% $[= 20\% \times 0.50 + (-5\% \times 0.50)]$ goes to PF, UF, and SVFOF managers as fees. Note that $\{[0.50 \times (2\% + 3.6\% + 2\% + 0\%)] + (1\% + 0.27\%)\}/7.5\%$ equals 67.6%. This is an example of fee netting risk that comes with investing in FoFs.

EXAMPLE 13

Fund-of-Funds or Multi-Strategy Funds—Which to Choose?

The Leonardo family office in Milan manages the €435 million fortune of the Da Vinci family. Mona, the family's matriarch, trained as an economist and worked at Banca d'Italia for many years. She is now retired but still monitors global financial markets. The portfolio that Leonardo manages for the Da Vinci family consists of traditional long-only stocks and bonds, real estate, private equity, and single manager hedge funds following distressed securities and merger arbitrage strategies.

Mona believes global financial markets are about to enter a prolonged period of heightened volatility, so she asks Leonardo's senior portfolio manager to sell some long-only stocks and the merger arbitrage hedge fund and then buy a multi-manager hedge fund. Mona's objectives are to increase the portfolio's diversification, flexibility, and transparency while maximizing net-of-fees returns during the volatile period ahead.

Discuss advantages and disadvantages that Leonardo's portfolio manager should consider in choosing between a FoF and a multi-strategy fund.

Solution:

Leonardo's portfolio manager understands that both multi-strategy funds and FoFs are designed to offer steady, low-volatility returns via their strategy diversification.

However, digging deeper he sees that multi-strategy funds have generally outperformed FoFs. This may be because of such key advantages as their enhanced flexibility and the fast pace of tactical asset allocation (important in dynamic, volatile markets) given that the different strategies are executed within the same fund structure. Another advantage of this set-up of multi-strategy funds is increased transparency regarding overall positions and exposures being carried. Moreover, many multi-strategy funds have an investor-friendly fee structure, in which fee netting risk is handled at the strategy level and absorbed (or partially absorbed) by the general partner of the multi-strategy fund. As for disadvantages, Leonardo's portfolio manager should consider that multi-strategy funds entail

higher manager-specific operational risks, so detailed due diligence is important; moreover, they tend to use relatively high leverage, which may increase the variance of returns.

The main advantages of FoFs are that they offer a potentially more diverse strategy mix with lower leverage (and somewhat less return variance), and they have less operational risk (i.e., each separate underlying hedge fund is responsible for its own risk management). Leonardo's portfolio manager realizes that FoFs also entail reduced transparency into the portfolio decisions made at the underlying hedge funds as well as a slower tactical reaction time. Another key disadvantage is that FoFs require a double layer of fees to be paid, with netting risk borne by the investor, which imposes a substantial drag on net-of-fees returns.

9

ANALYSIS OF HEDGE FUND STRATEGIES

From the foregoing discussion, it is reasonable to conclude the following: L/S equity and event-driven managers tend to be exposed to some natural equity market beta risk; arbitrage managers often are exposed to credit spread risk and market volatility tail risk; opportunistic managers tend to have risk exposures to the trendiness (or directionality) of markets; and relative value managers do not expect trendiness but are typically counting on mean reversion. Each strategy has unique sources of factor exposures and resulting vulnerabilities. Moreover, risk factor exposures in many strategies arise from simply holding financial instruments whose prices are directly impacted by those risk factors. That is, long and short exposures to a given risk factor in different securities are not equal, thereby giving rise to a non-zero *net* exposure. Following a practice-based risk factor perspective, this reading uses a conditional linear factor model to uncover and analyze hedge fund strategy risk exposures. While this is just one way to go about explaining hedge fund strategies' risks and returns, it is representative of the widely used risk factor approach.

One may ask why it is necessary to use such a model to investigate hedge fund strategies. It is because a linear factor model can provide insights into the intrinsic characteristics and risks in a hedge fund investment. Moreover, given the dynamic nature of hedge fund strategies, a conditional model allows for the analysis in a specific market environment to determine, for example, whether hedge fund strategies are exposed to certain risks under abnormal market conditions. A conditional model can show whether hedge fund risk exposures (e.g., to credit or volatility) that are insignificant during calm market periods may become significant during turbulent market periods. The importance of using a conditional factor model is underscored by the fact that the hedge fund industry is dynamic; for example, it experienced a huge decline in AUM during the global financial crisis. Specifically, after recording more than a 25% CAGR (compound annual growth rate) in assets between 2000 and 2007, the global hedge fund industry's aggregate AUM declined by 17% CAGR between 2007 and 2009 (the period of the global financial crisis) from a high of more than \$2.6 trillion. Moreover, global AUM did not surpass the 2007 high until 2014. In short, thousands of hedge funds were shuttered during this time as performance plunged when many managers were caught off guard by their funds' actual risk exposures during the crisis period and in its aftermath.

9.1 Conditional Factor Risk Model

A simple conditional linear factor model applied to a hedge fund strategy's returns can be represented as:

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

- $(\text{Return on HF})_t$ is the return of hedge fund i in period t ;
- $\beta_{i,1}(\text{Factor 1})_t$ represents the exposure to risk factor 1 (up to risk factor K) for hedge fund i in period t during normal times;
- $D_t\beta_{i,1}(\text{Factor 1})_t$ represents the *incremental* exposure to risk factor 1 (up to risk factor K) for hedge fund i in period t during financial crisis periods, where D_t is a dummy variable that equals 1 during financial crisis periods (i.e., June 2007 to February 2009) and 0 otherwise;
- α_i is the intercept for hedge fund i ; and
- $(\text{error})_{i,t}$ is random error with zero mean and standard deviation of σ_i .

Each factor beta represents the expected change in hedge fund returns for a one-unit increase in the specific risk factor, holding all other factors (independent variables) constant. The portion of hedge fund returns not explained by the risk factors is attributable to three sources: 1) alpha, the hedge fund manager's unique investment skills; 2) omitted factors; and 3) random errors. The starting point for building this model is the identification of a comprehensive set of asset class and macro-oriented, market-based risks, including the behavior of stocks, bonds, currencies, commodities, credit spreads, and volatility. Following Hasanhodzic and Lo (2007) and practice, the model starts with the following six factors:

- **Equity risk (SNP500):** monthly total return of the S&P 500 Index, including dividends.
- **Interest rate risk (BOND):** monthly return of the Bloomberg Barclays Corporate AA Intermediate Bond Index.
- **Currency risk (USD):** monthly return of the US Dollar Index.
- **Commodity risk (CMDTY):** monthly total return of the Goldman Sachs Commodity Index (GSCI).
- **Credit risk (CREDIT):** difference between monthly seasoned Baa and Aaa corporate bond yields provided by Moody's.
- **Volatility risk (VIX):** first-difference of the end-of-month value of the CBOE Volatility Index (VIX).

Once these potentially relevant macro risk factors were identified for analysis, the next consideration was the appropriateness of using them together in the model. To address the issue of highly correlated risk factors and to avoid potential multicollinearity problems, a four-step "stepwise regression" process was used to build a conditional linear factor model that is less likely to include highly correlated risk factors. This process is described briefly in the accompanying sidebar.

Practical Steps for Building Hedge Fund Risk Factor Models

The following four-step procedure describes a stepwise regression process that can help build linear conditional factor models that are less likely to include highly correlated risk factors, thereby avoiding multi-collinearity issues.

Step 1: Identify potentially important risk factors.

Step 2: Calculate pairwise correlations across all risk factors. If two-state conditional models are used, calculate correlations across all risk factors for both states—for example, during normal market conditions (state 1) and during market crisis conditions (state 2). For illustration purposes, risk factors A and B can be assumed to be highly correlated if the correlation coefficient between them exceeds 60%.

Step 3: For highly correlated risk factors A and B, regress the return series of interest (e.g., hedge fund returns) on all risk factors excluding factor A. Then, regress the same returns on the all risk factors, but this time exclude factor B. Given the adjusted R^2 for regressions without A and without B, keep the risk factor that results in the highest adjusted R^2 .

Step 4: Repeat step 3 for all other highly correlated factor pairs, with the aim of eliminating the least useful (in terms of explanatory power) factors and thereby avoiding multi-collinearity issues.

To address the multi-collinearity problem, the stepwise regression procedure was implemented using two of the hedge fund databases mentioned previously: Lipper TASS (TASS) and Morningstar Hedge/CISDM (CISDM). The accompanying sidebar provides useful background for practitioners on these two important sources of hedge fund information.

Hedge Fund Databases

The analysis in this reading uses two well-known hedge fund databases to evaluate hedge fund strategies: Lipper TASS (TASS) and Morningstar Hedge/CISDM (CISDM) databases. These databases are among the ones most widely used for hedge fund research.

The analysis covers the period of 2000–2016. Each database is separated into “live” (operating/open), “defunct” (non-operating/shut down or operating/closed to new investment or operating/delisted and relisted with another database), and “all” funds (live + defunct) groups. Hedge fund return data are filtered to exclude funds that 1) do not report net-of-fee returns; 2) report returns in currencies other than US dollar; 3) report returns less frequently than monthly; 4) do not provide AUM or estimates; and 5) have less than 36 months of return data. TASS and CISDM databases have a total of 6,352 and 7,756 funds, respectively. Importantly, 82% (18%) and 80% (20%) of all TASS and CISDM funds, respectively, are defunct (live). This is consistent with the relatively high attrition rate of hedge funds and the relatively short life of a typical hedge fund.

Databases that include defunct funds can be highly useful for asset allocators because the historical track record of managers that may be starting new funds might be found to include defunct funds. Then, further analysis could be conducted to determine if such funds became defunct because of the managers’ poor performance and/or excessive redemptions, so they were shut down, or because of the managers’ initial success, such that an overabundance of inflows caused subsequent investment capacity issues. From a data analysis point of view, including defunct funds also helps to appropriately adjust for database survivorship bias that might otherwise yield incorrect analytical conclusions.

Live, Defunct, and All Funds in TASS Database from 2000–2016

Grouping	TASS Primary Categories	Number of Live Funds	Number of Defunct Funds	Total Number of Funds
Equity	Dedicated short bias	4	38	42
Equity	Equity market neutral	38	270	308
Equity	Long/short equity hedge	350	1,705	2,055
Event driven	Event driven	87	465	552
Relative value	Convertible arbitrage	17	162	179
Relative value	Fixed income arbitrage	42	167	209
Opportunistic	Global macro	59	266	325
Opportunistic	Managed futures	1	2	3
Multi-manager	Fund of funds	454	1,711	2,165
Multi-manager	Multi-strategy	100	414	514
Total		1,152	5,200	6,352

Live, Defunct, and All Funds in CISDM Database from 2000–2016

Grouping	CISDM Categories	Number of Live Funds	Number of Defunct Funds	Total Number of Funds
Equity	Asia/Pacific long/short equity	31	203	234
Equity	Bear market equity	2	36	38
Equity	Equity market neutral	40	272	312
Equity	Europe long/short equity	47	161	208
Equity	Global long/short equity	86	406	492
Equity	US long/short equity	218	849	1,067
Equity	US small-cap long/short equity	67	171	238
Event driven	Merger arbitrage	22	16	38
Event driven	Distressed securities	46	159	205
Event driven	Event driven	63	228	291
Relative value	Convertible arbitrage	25	125	150
Relative value	Debt arbitrage	32	141	173
Opportunistic	Global macro	84	380	464
Opportunistic	Systematic futures	182	518	700
Multi-manager	Fund of funds – debt	20	97	117
Multi-manager	Fund of funds – equity	104	592	696
Multi-manager	Fund of funds – event	10	124	134
Multi-manager	Fund of funds – macro/systematic	30	163	193

(continued)

(Continued)

Grouping	CISDM Categories	Number of Live Funds	Number of Defunct Funds	Total Number of Funds
Multi-manager	Fund of funds – multi-strategy	164	789	953
Multi-manager	Fund of funds – relative value	12	83	95
Multi-manager	Multi-strategy	111	395	506
Specialist	Volatility	28	30	58
Specialist	Long/short debt	115	279	394
Total		1,539	6,217	7,756

Using TASS and CISDM datasets, the stepwise regression procedure resulted in both BOND and CMDTY factors being dropped from the final conditional linear risk model because of multi-collinearity issues. This is because retaining CREDIT and SNP500 factors produced higher adjusted R^2 s compared to retaining BOND and CMDTY factors.

Exhibit 12 provides useful information for interpreting the effects of the factor exposures included in the conditional risk model on hedge fund strategy returns. For both normal and crisis periods, it shows the four risk factors, the typical market trend during these periods, the hedge fund manager's desired position (long or short), and the desired factor exposure for benefitting from a particular market trend.

Exhibit 12 Interpretation of Conditional Risk Factor Exposures

Period/Risk Factor	Typical Market Trend	Desired Position	Desired Factor Exposure	Comments
Normal				
SNP500	Equities Rising	Long	Positive	Aims to add risk, increase return
CREDIT	Spreads Flat/Narrowing	Long	Positive	Aims to add risk, increase return
USD	USD Flat/Depreciating	Short	Negative	Sells USD to boost returns
VIX	Volatility Falling	Short	Negative	Sells volatility to boost returns
Crisis				
DSNP500	Equities Falling Sharply	Short	Negative	Aims to reduce risk
DCREDIT	Spreads Widening	Short	Negative	Aims to reduce risk
DUSD	USD Appreciating	Long	Positive	USD is haven in crisis periods
DVIX	Volatility Rising	Long	Positive	Negative correlation with equities

9.2 Evaluating Equity Hedge Fund Strategies

Using data from the CISDM and TASS databases from 2000 to 2016, this section discusses key return and risk characteristics for hedge funds pursuing equity-related strategies. More specifically, the conditional factor model is used to assess average risk exposures (during both normal and crisis market periods) for all “live” funds in each of the equity-related categories in these databases. Finally, the heterogeneity among funds, which is masked in the average exposures, is then revealed in an analysis showing the percentage of all hedge funds in each category that have significant factor exposures (positive and negative) during normal and crisis periods.

Note that the results of such a risk factor analysis may vary somewhat based on the hedge fund database used, the time period examined, and the specification of the factor model. However, the key takeaway is that such an analysis can uncover unintended adverse risk exposures to a hedge fund—stemming from the strategy it pursues—that may assert themselves only during turbulent market periods. As mentioned previously, unintended adverse risk exposures that revealed themselves during the global financial crisis resulted in the demise of literally thousands of hedge funds worldwide. Thus, understanding how to interpret the results of such a risk factor analysis is a key practical competency for any practitioner involved in advising on the strategies followed by hedge funds or in managing or owning the hedge funds themselves. First, we describe how the factor model can be used to understand risk exposures of equity-related hedge fund strategies. Then, we turn to understanding risks of multi-manager strategies.

The key return characteristics are shown for equity-related hedge fund strategies by category in Exhibit 13. In addition to the Sharpe ratio, we calculate the Sortino ratio.² The Sortino ratio replaces standard deviation in the Sharpe ratio with downside deviation, so it concentrates on returns below a specified threshold. For example, if the threshold return is zero, then the Sortino ratio uses downside deviation based on losses. Because hedge funds potentially invest in illiquid securities (which artificially smooth returns, thus lowering the measured standard deviation), besides measuring risk and return one should also investigate the autocorrelation of returns. Rho is a measure of first order serial autocorrelation, the correlation between a fund’s return and its own lagged returns. High Rho signals smoothed returns and thus is an indicator of potential liquidity issues (specifically, illiquidity and infrequent trading) in the underlying securities.

Exhibit 13 shows that L/S Equity Hedge (TASS) has the highest mean return (11.30%) but also the highest standard deviation (22.86%). Among categories with more than four funds, EMN (TASS) has the highest Sharpe ratio; notably, despite having the highest standard deviation, L/S Equity Hedge (TASS) also has the highest Sortino ratio; and Global L/S Equity (CISDM) shows the largest Rho. Overall, these results indicate that by accepting some beta and illiquidity exposure, L/S equity managers generally outperform equity market-neutral managers in terms of total returns delivered. Returns of L/S equity managers, however, are also more volatile than those of EMN managers and so produce lower Sharpe ratios. Intuitively, these results are in line with expectations.

² In addition to Sharpe and Sortino ratios, other performance measures can be used, such as the Treynor ratio, information ratio, return on VaR, Jensen’s alpha, M^2 , maximum drawdown, and gain-to-loss ratio.

Exhibit 13 Key Return Characteristics for Equity Hedge Fund Strategies (2000–2016)

Database	Category	Sample Size	Annualized Mean (%)		Annualized Sharpe Ratio		Annualized Sortino Ratio		Rho (%)	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD
TASS	Dedicated short bias	4	2.91	14.75	2.27	4.36	1.35	1.07	20.0	45.7
CISDM	Bear market equity	2	2.04	7.37	0.29	1.18	0.70	1.47	9.15	1.79
TASS	Equity market neutral	38	7.81	10.20	0.83	0.56	0.80	0.53	9.3	15.8
CISDM	Equity market neutral	40	7.48	8.82	0.79	0.81	0.65	0.92	16.29	8.88
TASS	Long/short equity hedge	350	11.30	22.86	0.62	0.64	1.33	1.04	11.0	13.5
CISDM	Global long/short equity	86	8.83	16.93	0.44	0.57	0.76	1.09	17.43	15.63
CISDM	Asia/Pacific long/short equity	31	8.87	20.27	0.45	0.36	0.73	0.57	16.72	10.49
CISDM	Europe long/short equity	47	7.05	11.59	0.56	0.37	0.69	1.08	13.92	10.53
CISDM	US long/short equity	218	9.41	17.50	0.62	0.46	0.60	0.55	12.76	8.98
CISDM	US small cap long/short equity	67	9.88	19.60	0.65	0.48	1.14	0.86	11.71	7.44

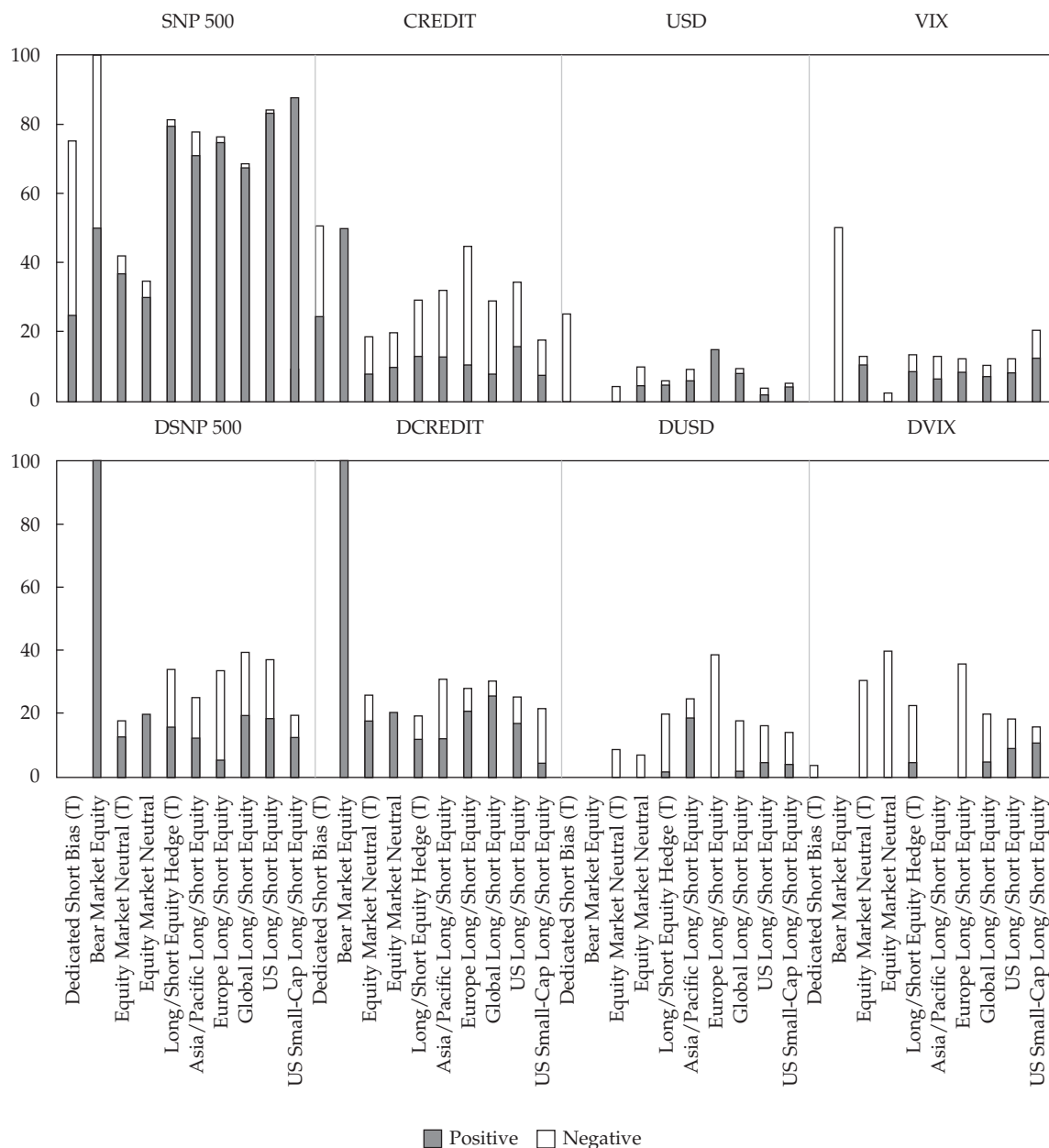
Taking a more granular view of factor risks, Exhibit 14 presents average risk exposures (equity, credit, currency, and volatility) for equity-related hedge fund strategies using the conditional risk factor model from 2000 to 2016. The crisis period is from June 2007 to February 2009, and crisis period factors are preceded by the letter “D” (e.g., the crisis period equity factor is DSNP500). Light (dark) shaded coefficients have *t*-statistics greater than 1.96 (1.67) and are significant at the 5% (10%) level.

Exhibit 14 Risk Exposures for Equity Hedge Funds Using the Conditional Risk Factor Model (2000–2016)

Strategy	Dedicated Short Bias	Bear Market Equity	Equity Market Neutral	Equity Market Neutral	Asia/ Pacific Long/ Short Equity	Europe Long/ Short Equity	Global Long/ Short Equity	US Long/ Short Equity	US Small Cap Long/ Short Equity	Long/ Short Equity Hedge
Database	TASS	CISDM	TASS	CISDM	CISDM	CISDM	CISDM	CISDM	CISDM	TASS
Sample Size	4	2	38	40	31	47	86	218	67	350
Normal Times Exposures										
Intercept	−0.02	0.00	0.01	0.01	0.01	0.01	0.02	−0.01	0.01	0.01
SNP500	−0.28	−0.46	0.11	0.09	0.42	0.24	0.52	0.58	0.58	0.41
USD	−0.13	−0.07	−0.02	0.00	−0.02	0.06	−0.01	−0.03	−0.01	−0.04
CREDIT	1.24	0.22	−0.12	−0.07	−0.26	−0.23	−0.77	0.63	−0.09	−0.20
VIX	0.04	−0.05	0.01	0.00	−0.01	0.02	−0.01	−0.03	0.03	0.07
Crisis Times Exposures (Incremental)										
DSNP500	0.04	0.11	0.04	0.05	−0.02	−0.14	−0.04	0.03	−0.02	−0.03
DUSD	−0.08	−0.06	−0.17	−0.02	0.15	−0.42	−0.07	−0.07	−0.09	−0.17
DCREDIT	0.02	0.05	0.06	0.10	−0.01	0.07	0.16	0.03	−0.20	0.07
DVIX	0.00	−0.02	−0.06	−0.04	−0.04	−0.09	−0.04	0.02	−0.02	−0.02

On average, funds following EMN strategies maintain low exposure to equity market risk (0.11, significant at 10%) as well as a neutral exposure to the other risk factors in the model in both normal and crisis periods. L/S equity strategies maintain significant (at the 5% level) average beta loadings to equity risk during normal periods. The equity risk betas range from 0.24 for Europe L/S Equity to 0.58 for both US and US Small Cap L/S Equity strategies. Although there are no significant incremental (i.e., additional) exposures to equity risk (DSNP500) during crisis periods, total exposures during crisis periods (normal + crisis) are positive and significant for all L/S equity strategies. For example, the total equity exposure in crisis times for US L/S Equity is 0.61 (= 0.58 + 0.03). Because they show average exposures across all live funds in the given strategy category, these results mask significant heterogeneity between funds in their exposures to the four risk factors.

Exhibit 15 highlights this heterogeneity by presenting the percentage of funds experiencing significant (at the 10% level or better) factor exposures within each strategy category. The (T) indicates funds from the TASS database, and all other funds are from CISDM; gray (white) bars signify positive (negative) factor exposures. The y-axis indicates the percentage of funds within each strategy category that experienced the significant risk exposures.

Exhibit 15 Significant Positive and Negative Factor Exposures for Funds by Equity Hedge Strategy During Normal and Crisis Periods (2000–2016)

For example, with the exception of dedicated short-biased funds, most equity-related hedge funds have significant positive exposure to equity risk during normal market periods (30%+ for EMN funds and 70%+ for L/S equity funds). However, during crisis periods, less than 40% of L/S equity funds have any significant incremental equity exposure; for those that do, their added exposure is mixed (negative and positive). This suggests that managers were able to decrease adverse crisis period effects on their returns—likely by deleveraging, outright selling of stock (short sales, too) and equity index futures, and/or by buying index put options. This also indicates that although they did not reduce long beta tilting by much, on average L/S equity managers did not make things worse by trying to aggressively “bottom pick” the market. Finally, these results are consistent with the average incremental equity exposure during crisis periods of approximately zero, as seen in the previous exhibit.

As one might intuitively expect, most L/S equity managers do not have significant exposure to CREDIT. Only about one-third of L/S equity funds have significant exposure to CREDIT—mainly negative exposure, indicating that they are unlikely to benefit from moderating credit risk (spreads narrowing, credit upgrades). Interestingly, for the 25% of funds with significant incremental crisis period CREDIT exposure, these exposures become more positive, which would tend to hurt returns as spreads widen and credit downgrades accelerate during market sell-offs. Similarly, exposures to USD and VIX for L/S equity funds are marginal during normal times, with few funds having any significant exposures. However, in most cases during crisis periods, any significant additional exposures are mainly negative. For example, about 40% of Europe L/S Equity funds show significant negative exposure to USD—perhaps expecting a crisis-induced flight to quality into the euro or Japanese yen as opposed to USD. Again, nearly 40% of these funds show negative added VIX exposure (i.e., short volatility) during crisis times. Returns of some high-profile hedge funds have been hurt by being unexpectedly short volatility during crisis periods, which underscores why understanding the heterogeneity of factor exposures is important to understanding risk profiles of hedge funds.

EXAMPLE 14

Dedicated Short-Biased Hedge Fund

Bearish Asset Management (BAM) manages a short-biased hedge fund that varies its portfolio's short tilt depending on perceived opportunities. Using the fund's monthly returns for the past 10 years, which include periods of financial market crisis, a conditional risk factor model was estimated. The following table provides factor beta estimates with corresponding *t*-statistics [dark (light) shaded are significant at the 5% (10%) level].

Interpret the factor loadings. Also, what can you infer about BAM's overall risk exposure during crisis periods?

Coefficient	Estimate	t-Statistic
Normal Times Exposures		
Intercept	0.005	1.10
USD	0.072	0.72
CREDIT	−0.017	−0.07
SNP500	−0.572	−9.65
VIX	−0.164	−2.19
Crisis Times Exposures (Incremental)		
DUSD	0.456	1.31
DCREDIT	−0.099	−0.40
DSNP500	0.236	1.74
DVIX	0.105	1.03

Solution:

BAM's fund has highly significant negative loadings on equity risk (SNP500) and volatility risk (VIX). The negative equity risk exposure is as expected for a short-biased strategy. But the negative VIX loading is consistent with short volatility exposure. This suggests that BAM's manager may be selling puts against some of its short exposures, thereby attempting to also capture a volatility premium. During crisis periods, the equity beta rises from −0.572 to −0.336 ($= -0.572 + 0.236 = -0.336$). This negative exposure is still significant and suggests that

despite being a short-biased fund, BAM had less negative equity risk exposure during crisis periods. In this case, the manager may be purposefully harvesting some of its short exposure into market weakness.

9.3 Evaluating Multi-Manager Hedge Fund Strategies

It is important to understand the risks of multi-manager hedge fund strategies. Exhibit 16 shows that multi-strategy hedge funds outperform funds-of-funds: They have higher mean returns (7.85%/TASS and 8.52%/CISDM) and among the highest Sharpe ratios and Sortino ratios. Multi-strategy funds have higher Rho (more than 20%) compared to FoF, indicating relatively high serial autocorrelation. This is reasonable because multi-strategy funds may be simultaneously running strategies using less liquid instruments, such as convertible arbitrage, fixed-income arbitrage, and other relative value strategies. That is why, unlike FoFs, they often impose investor-level or fund-level gates on maximum quarterly redemptions.

Exhibit 16 Key Return Characteristics for Multi-Manager Hedge Fund Strategies (2000–2016)

Database	Category	Sample Size	Annualized Mean (%)		Annualized Sharpe Ratio		Annualized Sortino Ratio		Rho (%)	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD
CISDM	Fund of funds – debt	20	6.52	7.94	0.89	0.66	0.68	1.17	13.89	4.24
CISDM	Fund of funds – equity	104	4.69	9.15	0.41	0.28	0.44	0.91	12.27	10.61
CISDM	Fund of funds – event	10	4.59	4.99	0.75	0.51	0.56	1.19	13.76	6.71
CISDM	Fund of funds – macro/systematic	30	5.09	10.16	0.39	0.39	0.57	0.60	8.15	3.52
CISDM	Fund of funds – multi-strategy	164	4.47	7.18	0.54	1.84	1.34	1.43	12.43	9.31
CISDM	Fund of funds – relative value	12	5.31	8.58	0.70	0.42	1.31	0.63	15.86	13.77
TASS	Fund of funds	454	5.73	10.03	0.38	0.71	0.52	0.62	19.9	18.1
CISDM	Multi-strategy	111	8.52	11.01	0.89	1.36	1.32	1.58	20.09	16.24
TASS	Multi-strategy	100	7.85	11.51	0.86	1.40	1.00	1.05	22.7	24.3

Exhibit 17 presents average risk exposures for multi-manager hedge fund strategies using the conditional risk factor model. The crisis period is from June 2007 to February 2009, and light (dark) shaded betas have *t*-statistics of more than 1.96 (1.67).

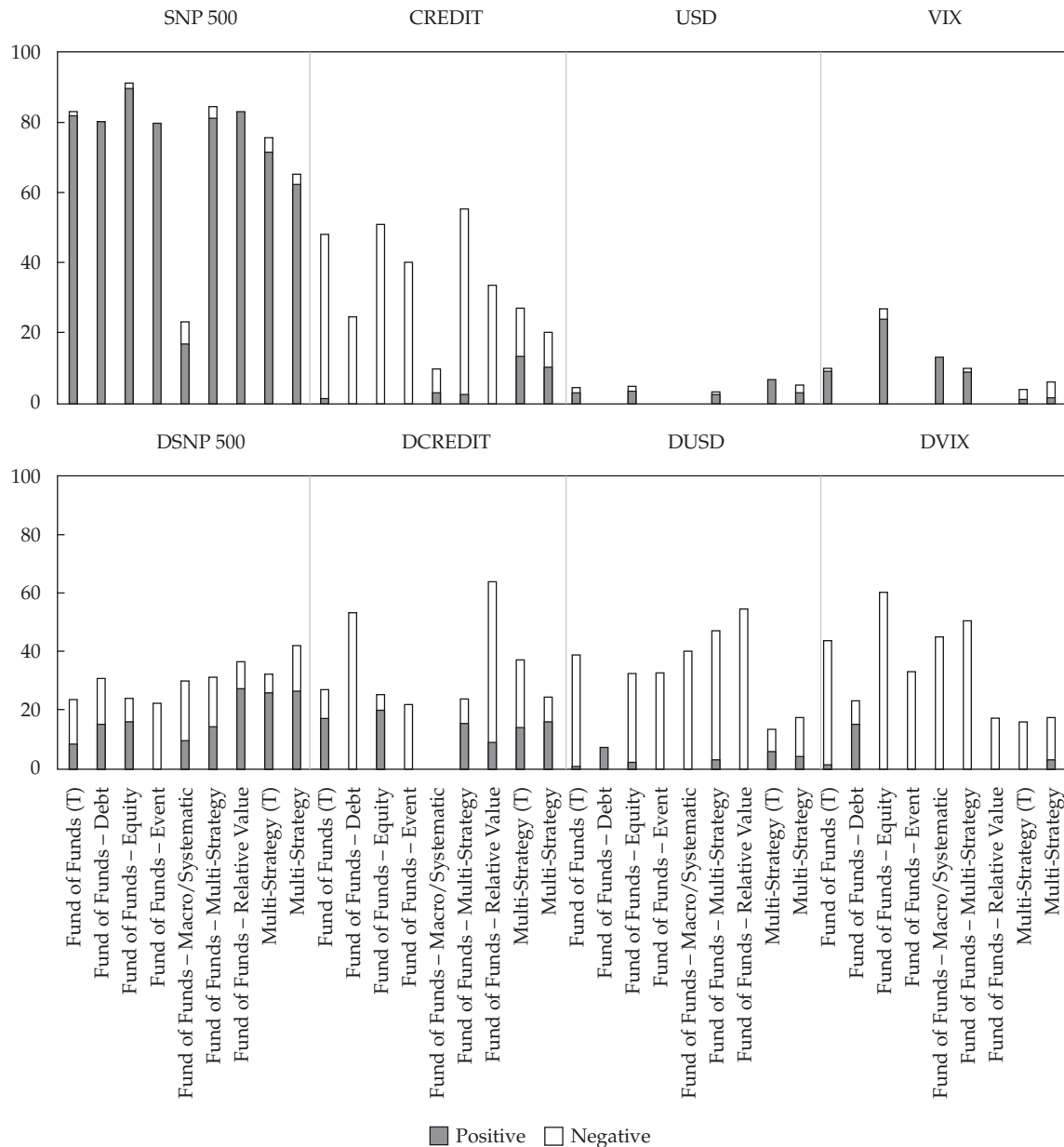
Exhibit 17 Risk Exposures for Multi-Manager Hedge Funds Using the Conditional Risk Factor Model (2000–2016)

Strategy	Fund of Funds – Debt	Fund of Funds – Equity	Fund of Funds – Event	Fund of Funds – Macro/Systematic	Fund of Funds – Multi-Strategy	Fund of Funds – Relative Value	Fund of Funds	Multi-Strategy	Multi-Strategy
Database	CISDM	CISDM	CISDM	CISDM	CISDM	CISDM	TASS	CISDM	TASS
Sample Size	20	104	10	30	163	12	454	111	100
Normal Times Exposures									
Intercept	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10	0.01
SNP500	0.16	0.33	0.14	–0.02	0.21	0.12	0.24	–0.14	0.22
USD	–0.01	0.01	0.01	–0.07	0.00	0.01	0.01	–0.41	–0.01
CREDIT	–0.36	–0.43	–0.22	–0.10	–0.28	–0.14	–0.45	–5.71	–0.03
VIX	0.00	0.03	0.00	0.04	0.01	0.02	0.01	–0.03	0.01
Crisis Times Exposures (Incremental)									
DSNP500	–0.02	0.02	–0.01	–0.01	0.00	0.02	0.00	0.05	0.06
DUSD	0.03	–0.09	–0.19	–0.21	–0.20	–0.27	–0.05	–0.05	–0.05
DCREDIT	–0.10	0.09	–0.13	0.01	0.03	–0.10	0.09	0.07	–0.05
DVIX	0.03	–0.09	–0.03	–0.05	–0.07	–0.06	–0.05	–0.02	–0.05

Results show that all FoF strategies (except macro/systematic) have significant positive exposure to equity risk (ranging from 0.14 to 0.33) for the full period. The finding for macro/systematic is consistent with results presented earlier for opportunistic hedge funds, which show they tend not to be exposed to equity risks in aggregate. Interestingly, multi-strategy funds have significant equity exposure but differing signs—negative (positive) for CISDM (TASS)—which highlights the heterogeneity between the two databases.

Multi-manager funds as a group do not appear to provide significant hedging benefits (via diversification) in crisis times. If they did, then significant negative exposures to DSNP500 would be observed. This is consistent with the research findings that in the 2007–2009 global financial crisis, diversification across hedge fund strategies did not decrease total portfolio risk. These researchers conclude that during crises, simple diversification is insufficient; rather, it is important to focus on such other risks as liquidity, volatility, and credit—particularly because these risks may be magnified by the application of leverage.

Exhibit 18 tells a different story when individual funds are studied. The majority of multi-manager funds have significant positive exposure to the equity factor, but around 30% of funds show a mix of negative and positive incremental exposures (DSNP 500) to equities during the crisis period. This suggests that at least some funds (ones with negative loadings) were able to shield their investors from substantial market declines by either deleveraging, selling equity pre-crisis, and/or short selling. About 40% of all multi-manager funds have significant, mostly negative, exposure to CREDIT, indicating that they generally were not positioned to benefit from improving credit spreads. In crisis times, they took on additional (mostly negative) CREDIT exposure. For example, about 50% of FoF-Debt and FoF-Relative Value funds experienced incremental negative CREDIT exposure during turbulent periods, which hedged them from deteriorating credit conditions.

Exhibit 18 Significant Positive and Negative Factor Exposures for Multi-Manager Hedge Funds During Normal and Crisis Periods (2000–2016)

For the full period, multi-manager funds have minimal exposures to USD and VIX. Notably, these exposures increase dramatically, becoming significantly negative during financial crises. For example, only 2% of FoF-Equity have negative exposure to VIX overall. But, 60% of these funds show additional significant negative VIX exposure in crisis times. A similar pattern is revealed for USD exposure. Such negative exposures would seem undesirable during times when volatility is spiking and the USD is likely appreciating. Natural embedded leverage may be a partial explanation for these seemingly undesirable exposures during crisis times. In sum, as crisis periods generate potentially unexpected exposures to systematic risks, it is essential to use conditional factor models to understand risks of hedge fund strategies.

PORTFOLIO CONTRIBUTION OF HEDGE FUND STRATEGIES

10

This section examines the return and risk contributions of the hedge fund strategies previously covered when added to a traditional 60% stock/40% bond investment portfolio.

10.1 Performance Contribution to a 60/40 Portfolio

For each hedge fund strategy category that has been discussed, we now consider an equal-weighted portfolio of the individual funds in that category. We examine the impact of a 20% allocation to such a hedge fund strategy portfolio when combined with a traditional investment portfolio consisting of 60% stocks and 40% bonds. The S&P500 Total Return Index and the Bloomberg Barclays Corporate AA Intermediate Bond Index are used to proxy the 60%/40% portfolio. When the hedge fund strategy portfolio is added to the traditional portfolio, the resulting allocations for the combined portfolio are 48% stocks, 32% bonds, and 20% in the particular hedge fund strategy portfolio. Please note this exercise is for illustrating the portfolio performance contribution of hedge fund strategies; practically speaking, it is unlikely an investor would hold an allocation (here 20%) that included an equal weighting of all live funds in one particular hedge fund strategy category.

Exhibit 19 provides performance and risk metrics for the combined portfolios from 2000 to 2016. It shows that when added to a traditional 60%/40% portfolio (with a mean return of 6.96%), a 20% allocation to the US Small Cap L/S Equity strategy generates the highest mean return (7.53%) of all the combined portfolios—an improvement of 57 bps. Adding a 20% allocation of an equal-weighted portfolio of funds in any of the following hedge fund categories to the traditional portfolio produces average annual returns of more than 7.30%: fixed-income arbitrage, distressed securities, or systematic futures. Adding a 20% allocation of any of the hedge fund strategies shown in Exhibit 19 to the traditional portfolio almost always decreases total portfolio standard deviation while increasing Sharpe and Sortino ratios (and also decreasing maximum drawdown in about one-third of the combined portfolios). These results demonstrate that hedge funds act as both risk-adjusted return enhancers and diversifiers for the traditional stock/bond portfolio.

Exhibit 19 Performance and Risk of 48/32/20 Portfolio, Where 20% Allocation Is to an Equal-Weighted Portfolio for Each Hedge Fund Strategy Category (2000–2016)

Category	Type	Database	Mean Return (%)	SD (%)	Sharpe Ratio	Sortino Ratio	Maximum Drawdown (%)
60% Stocks/40% Bonds	Traditional Portfolio	—	6.96	8.66	0.62	1.13	14.42
Long/Short Equity Hedge	Equity	TASS	7.22	8.29	0.68	1.45	21.34
Global Long/Short Equity	Equity	CISDM	7.06	8.17	0.67	1.22	22.51
U.S. Long/Short Equity	Equity	CISDM	7.17	8.22	0.68	1.24	16.77
U.S. Small Cap Long/ Short Equity	Equity	CISDM	7.53	8.75	0.68	1.23	27.02
Asia/Pacific Long/Short Equity	Equity	CISDM	6.44	8.12	0.60	1.07	21.74

(continued)

Exhibit 19 (Continued)

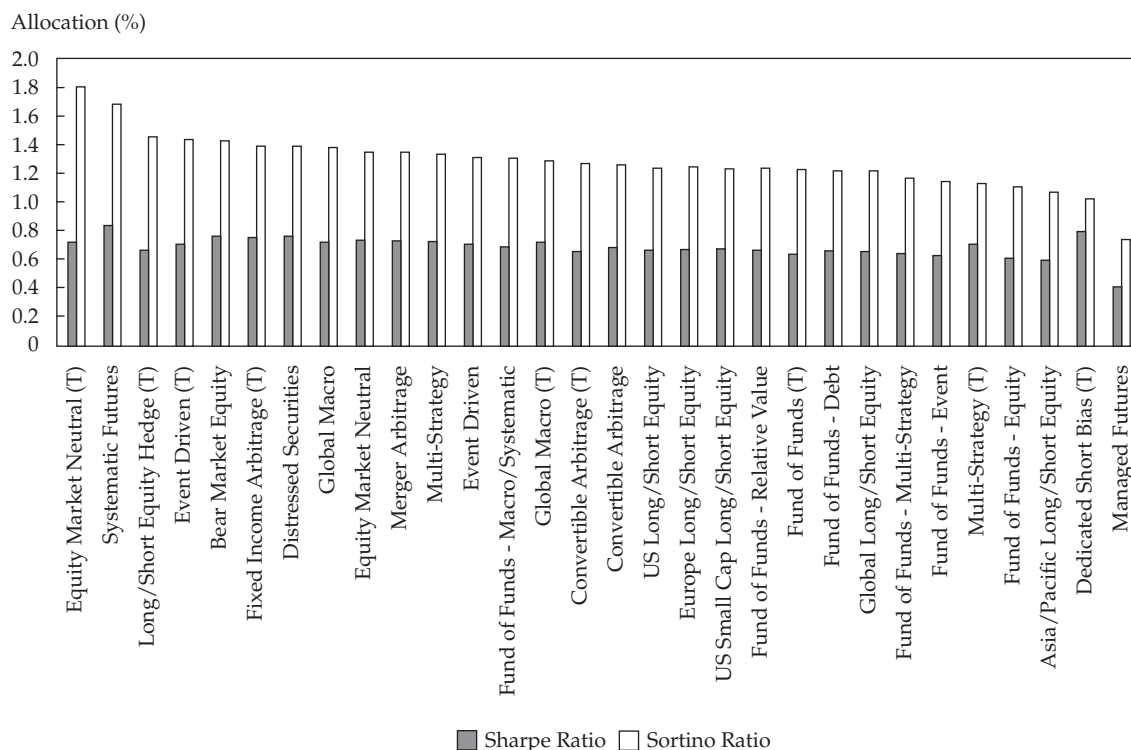
Category	Type	Database	Mean Return (%)	SD (%)	Sharpe Ratio	Sortino Ratio	Maximum Drawdown (%)
Europe Long/Short Equity	Equity	CISDM	6.79	7.69	0.67	1.24	15.20
Dedicated Short Bias	Equity	TASS	6.02	5.59	0.79	1.02	16.06
Bear Market Equity	Equity	CISDM	5.97	5.68	0.77	1.43	16.62
Equity Market Neutral	Equity	TASS	6.81	7.17	0.73	1.80	10.72
Equity Market Neutral	Equity	CISDM	6.79	7.13	0.73	1.36	4.99
Event Driven	Event Driven	TASS	7.13	7.76	0.71	1.44	20.96
Event Driven	Event Driven	CISDM	7.19	7.83	0.71	1.31	20.57
Distressed Securities	Event Driven	CISDM	7.40	7.67	0.75	1.38	20.00
Merger Arbitrage	Event Driven	CISDM	6.85	7.22	0.73	1.35	5.60
Convertible Arbitrage	Relative Value	TASS	6.76	7.75	0.66	1.27	31.81
Fixed-Income Arbitrage	Relative Value	TASS	7.50	7.82	0.75	1.39	12.68
Convertible Arbitrage	Relative Value	CISDM	6.91	7.68	0.69	1.25	27.91
Global Macro	Opportunistic	TASS	6.96	7.36	0.73	1.29	5.14
Global Macro	Opportunistic	CISDM	6.97	7.29	0.74	1.38	5.19
Systematic Futures	Opportunistic	CISDM	7.34	6.94	0.83	1.68	8.04
Fund of Funds	Multi- Manager	TASS	6.43	7.53	0.64	1.23	18.92
Multi-Strategy	Multi- Manager	TASS	6.98	7.57	0.71	1.13	17.35
Fund of Funds – Debt	Multi- Manager	CISDM	6.56	7.40	0.67	1.22	17.77
Fund of Funds – Equity	Multi- Manager	CISDM	6.39	7.76	0.62	1.11	21.63
Fund of Funds – Event	Multi- Manager	CISDM	6.35	7.48	0.63	1.15	21.37
Fund of Funds - Macro/ Systematic	Multi- Manager	CISDM	6.47	7.05	0.69	1.31	10.65
Fund of Funds – Multi-Strategy	Multi- Manager	CISDM	6.36	7.41	0.64	1.17	18.17
Fund of Funds - Relative Value	Multi- Manager	CISDM	6.46	7.22	0.67	1.23	17.16
Multi-Strategy	Multi- Manager	CISDM	7.00	7.47	0.72	1.34	13.83

The Sharpe ratio measures risk-adjusted performance, where risk is defined as standard deviation, so it penalizes both upside and downside variability. The Sortino ratio measures risk-adjusted performance, where risk is defined as downside deviation, so it penalizes only downside variability below a minimum target return. For hedge fund strategies with large negative events, the Sortino ratio is considered a better performance measure. The combined portfolio with the highest Sharpe ratio (0.83)

includes a 20% allocation to systematic futures hedge funds. High Sharpe ratios are also achieved from allocations to distressed securities, fixed-income arbitrage, and global macro or equity market-neutral strategies. Adding allocations of 20% consisting of hedge funds from equity market-neutral (TASS), systematic futures, L/S equity hedge, or event-driven (TASS) categories to the traditional portfolio produces combined portfolios with by far the best Sortino ratios.

Exhibit 20 plots the Sharpe and Sortino ratios for 48/32/20 portfolios, where the 20% allocation is to an equal-weighted portfolio of the funds in each hedge fund strategy category. As a point of reference, the Sharpe and Sortino ratios for the 60/40 portfolio are 0.62 and 1.13, respectively. This graphic visually demonstrates that adding allocations of systematic futures, equity market-neutral, global macro, or event-driven hedge fund strategies, among others, to the traditional portfolio is effective in generating superior risk-adjusted performance—as evidenced by their relatively high Sharpe and Sortino ratios. Moreover, the implication is that despite the flexibility to invest in a wide range of strategies, fund-of-funds and multi-manager funds do not enhance risk-adjusted performance very much.

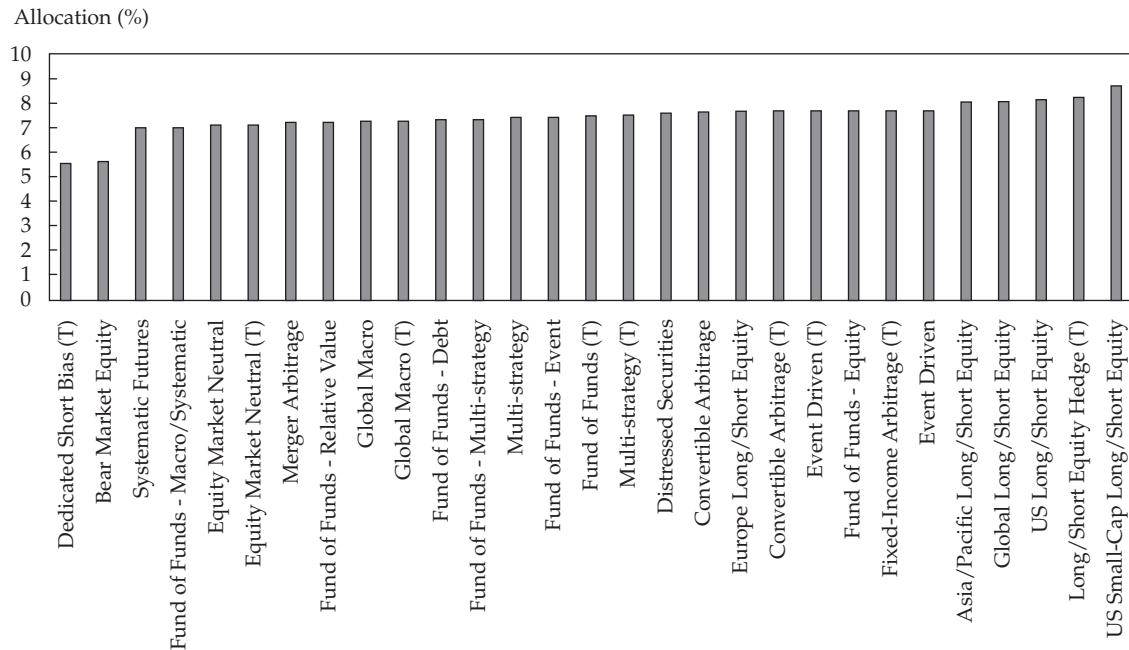
Exhibit 20 Sharpe and Sortino Ratios for 48/32/20 Portfolios, Where 20% Allocation Is to an Equal-Weighted Portfolio for Each Hedge Fund Strategy Category



10.2 Risk Metrics

Considering the different risk exposures and investments that hedge fund strategies entail, many investors consider these strategies for portfolio risk reduction or risk mitigation. Exhibit 21 illustrates which strategies may be most effective in reducing risk in a traditional portfolio (with standard deviation of 8.66%). The exhibit presents the standard deviation of returns for 48/32/20 portfolios, where the 20% allocation is to an equal-weighted portfolio for each hedge fund strategy category.

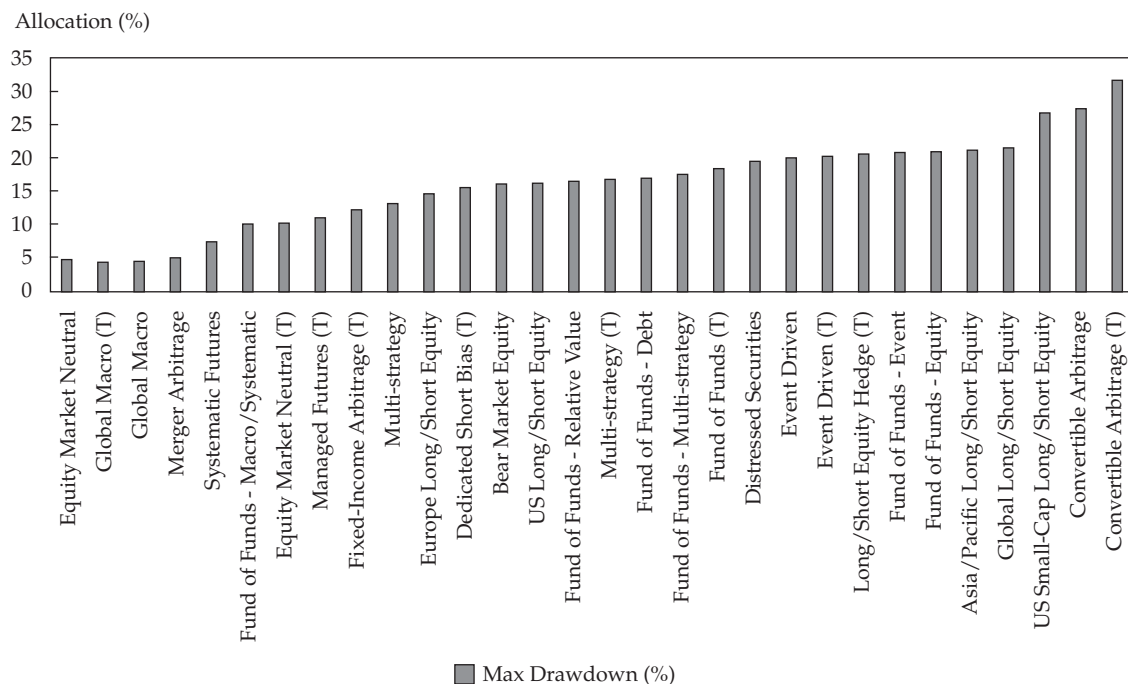
Exhibit 21 Standard Deviations for 48/32/20 Portfolios, Where 20% Allocation Is to an Equal-Weighted Portfolio for Each Hedge Fund Strategy Category



Besides dedicated short-biased and bear market-neutral strategies—for which there are only 6 live funds in total—it can be seen that among the hedge fund strategies that produce the lowest standard deviations of returns in the combined portfolios are systematic futures (6.94%) and FoF-macro/systematic and equity market neutral (a little more than 7.0%). These strategies appear to provide significant risk-reducing diversification benefits; and as discussed previously, they are also the same categories of hedge funds that enhance risk-adjusted returns when added to the traditional 60/40 portfolio. It is evident that standard deviations are relatively high for combined portfolios with event-driven/distressed securities and relative value/convertible arbitrage strategies, indicating they provide little in the way of risk-reduction benefits. This may be attributed to the binary, long-biased nature of most event-driven/distressed securities investing and the typical leverage downsizing/liquidity issues of relative value/convertible arbitrage during periods of market stress.

A drawdown is the difference between a portfolios' highest value (i.e., high-water mark) for a period and any subsequent low point until a new high-water mark is reached. Maximum drawdown is the *largest* difference between a high-water mark and a subsequent low point. The results for maximum drawdown for the 48/32/20 portfolios are shown in Exhibit 22.

Exhibit 22 Maximum Drawdowns for 48/32/20 Portfolios, Where 20% Allocation Is to an Equal-Weighted Portfolio for Each Hedge Fund Strategy Category



The graphic shows that when combined with the traditional stock and bond portfolio (with a maximum drawdown of 14.42%), the hedge fund strategy portfolios that generate the smallest maximum drawdowns are the opportunistic strategies—specifically, global macro and systematic futures as well as merger arbitrage and equity market-neutral strategies. Notably, the conditional risk model showed that these strategies did not have much exposure to high equity or credit risk during crisis periods. In addition, they also tend to be the strategies with the lowest serial autocorrelation, signaling good liquidity. This suggests that these types of strategies provide risk mitigation for traditional assets because they are not exposed to the same risks, are relatively opportunistic, and are liquid even during periods of market stress. On the other side of the spectrum, L/S equity strategies, event-driven/distressed securities strategies, and relative value/convertible arbitrage strategies show high maximum drawdowns when combined with the traditional portfolio. This is unsurprising because the conditional risk model showed that these event-driven and relative value strategies tended to hold equity risk and that their credit risk also became significant during crisis periods.

EXAMPLE 15

Combining a Hedge Fund Strategy with a Traditional Portfolio

DIY Investment Advisors is a “CIO in a box.” Its clients are mainly small institutions and local college endowments. Evergreen Tech, a private 4-year college, is a client with a \$150 million endowment and an enrollment of 3,000 students. The endowment’s portfolio, which supports 5% of Evergreen’s current annual spending needs, has a traditional asset allocation of 60% stocks/40% bonds. Evergreen plans to dramatically increase enrollment to 4,000 students over the next 5 years.

Patricia Chong, principal of DIY, wants to recommend to Evergreen's investment committee (IC) that it add alternative investments to the endowment's portfolio, specifically a 20% allocation to a hedge fund strategy. The IC has indicated to Chong that Evergreen's main considerations for the combined portfolio are that any hedge fund strategy allocation should a) maximize risk-adjusted returns; b) limit downside risk; and c) not impair portfolio liquidity. The IC is also sensitive to fees and considers it important to avoid layering of fees for any hedge fund allocation.

At Chong's request, DIY's hedge fund analysts perform due diligence on numerous hedge funds and assemble the following information on several short-listed funds, showing their past performance contribution to a 48% stocks/32% bonds/20% hedge fund strategy portfolio. Finally, Chong believes historical returns are good proxies for future returns.

Category	Type	Mean Return (%)	SD (%)	Sharpe Ratio	Sortino Ratio	Maximum Drawdown (%)
60% Stocks/40% Bonds	Traditional Portfolio	6.96	8.66	0.62	1.13	14.42
US small-cap long/ short equity	Equity	7.53	8.75	0.68	1.23	27.02
Event driven	Event driven	7.19	7.83	0.71	1.31	20.57
Sovereign debt fixed-income arbitrage	Relative value	7.50	7.82	0.75	1.39	12.68
Fund-of-funds – equity	Multi-manager	6.39	7.76	0.62	1.11	21.63

Use the information provided to answer the following questions.

- 1 Discuss which hedge fund strategy Chong should view as *least* suitable for meeting the considerations expressed by Evergreen's IC.
- 2 Discuss which hedge fund strategy Chong should view as *most* suitable for meeting the considerations expressed by Evergreen's IC.

Solution to 1:

Based on the IC's considerations, Chong should view a 20% allocation to the fund-of-funds equity hedge fund strategy as least suitable for Evergreen's endowment portfolio. Such an allocation offers no improvements in the combined portfolio's Sharpe and Sortino ratios (to 0.62 and 1.11, respectively). The substantially higher maximum drawdown (50% higher at 21.63%) indicates much more downside risk would be in the combined portfolio. Portfolio liquidity may also be impaired due to two levels of redemption lock-ups and liquidity gates. Finally, given the FoF structure for this strategy allocation, Evergreen would need to pay two layers of fees and would also likely face fee netting risk.

Solution to 2:

Based on the IC's considerations, Chong should view a 20% allocation to the sovereign debt fixed-income arbitrage hedge fund strategy as most suitable for Evergreen's endowment portfolio. Such an allocation would result in significant increases in the combined portfolio's Sharpe and Sortino ratios (to 0.75 and 1.39, respectively), the highest such ratios among the strategies presented. Besides the improvement in Sortino ratio, the lower maximum drawdown (12.68%) indicates less downside risk in the combined portfolio than with any of the other strategy choices. Portfolio liquidity would also likely not be impaired as this strategy

focuses on sovereign debt, which typically has good liquidity for most developed market issuers. Finally, similar to the other non-FoF strategies shown, Evergreen would pay only one layer of fees and would also not face any fee netting risk.

SUMMARY

- Hedge funds are an important subset of the alternative investments space. Key characteristics distinguishing hedge funds and their strategies from traditional investments include the following: 1) lower legal and regulatory constraints; 2) flexible mandates permitting use of shorting and derivatives; 3) a larger investment universe on which to focus; 4) aggressive investment styles that allow concentrated positions in securities offering exposure to credit, volatility, and liquidity risk premiums; 5) relatively liberal use of leverage; 6) liquidity constraints that include lock-ups and liquidity gates; and 7) relatively high fee structures involving management and incentive fees.
- Hedge fund strategies are classified by a combination of the instruments in which they are invested, the trading philosophy followed, and the types of risks assumed. Some leading hedge fund strategy index providers are Hedge Fund Research; Lipper TASS; Morningstar Hedge/CISDM; Eurekahedge; and Credit Suisse. There is much heterogeneity in the classification and indexes they provide, so no one index group is all-encompassing.
- This reading classifies hedge fund strategies by the following categories: equity-related strategies; event-driven strategies; relative value strategies; opportunistic strategies; specialist strategies; and multi-manager strategies.
- Equity L/S strategies take advantage of diverse opportunities globally to create alpha via managers' skillful stock picking. Diverse investment styles include value/growth, large cap/small cap, discretionary/quantitative, and industry specialization. Some equity L/S strategies may use index-based short hedges to reduce market risk, but most involve single name shorts for portfolio alpha and added absolute return.
- Equity L/S strategies are typically liquid and generally net long, with gross exposures at 70%–90% long vs. 20%–50% short (but they can vary).
- Equity L/S return profiles are typically aimed to achieve average annual returns roughly equivalent to a long-only approach but with standard deviations that are 50% lower. The more market-neutral or quantitative the strategy approach, the more levered the strategy application to achieve a meaningful return profile.
- Dedicated short sellers only trade with short-side exposure, but they may moderate short beta by also holding cash. Short-biased managers are focused on short-side stock picking, but they typically moderate short beta with some value-oriented long exposure and cash.
- Dedicated short strategies tend to be 60%–120% short at all times, while short-biased strategies are typically around 30%–60% net short. The focus in both cases is usually on single equity stock picking, as opposed to index shorting, and using little if any leverage.

- Dedicated short-selling and short-biased strategies have return goals that are typically less than most other hedge fund strategies but with a negative correlation benefit. Returns are more volatile than a typical L/S equity hedge fund given short beta exposure.
- Equity market-neutral (EMN) strategies take advantage of idiosyncratic short-term mispricing between securities. Their sources of return and alpha do not require accepting beta risk, so EMN strategies are especially attractive in periods of market vulnerability/weakness. There are many types of EMN managers, but most are purely quantitative managers (vs. discretionary managers).
- As many beta risks (e.g., market, sector) are hedged away, EMN strategies generally apply relatively high levels of leverage in striving for meaningful return targets.
- Equity market-neutral strategies exhibit relatively modest return profiles. Portfolios are aimed at market neutrality and with differing constraints to other factor/sector exposures. Generally high levels of diversification and liquidity with lower standard deviation of returns are typical due to an orientation toward mean reversion.
- Merger arbitrage is a relatively liquid strategy. Defined gains come from idiosyncratic, single security takeover situations, but occasional downside shocks can occur when merger deals unexpectedly fail.
- Cross-border M&A usually involves two sets of governmental approvals. M&A deals involving vertical integration often face antitrust scrutiny and thus carry higher risks and offer wider merger spread returns.
- Merger arbitrage strategies have return profiles that are insurance-like, plus a short put option, with relatively high Sharpe ratios; however, left-tail risk is associated with otherwise steady returns. Merger arbitrage managers typically apply moderate to high leverage to generate meaningful target return levels.
- Distressed securities strategies focus on firms in bankruptcy, facing potential bankruptcy, or under financial stress. Hedge fund managers seek inefficiently priced securities before, during, or after the bankruptcy process, which results in either liquidation or reorganization.
- In liquidation, the firm's assets are sold off and securities holders are paid sequentially based on priority of their claims—from senior secured debt, junior secured debt, unsecured debt, convertible debt, preferred stock, and finally common stock.
- In re-organization, a firm's capital structure is re-organized and terms for current claims are negotiated and revised. Debtholders either may agree to maturity extensions or to exchanging their debt for new equity shares (existing shares are canceled) that are sold to new investors to improve the firm's financial condition.
- Outright shorts or hedged positions are possible, but distressed securities investing is usually long-biased, entails relatively high levels of illiquidity, and has moderate to low leverage. The return profile is typically at the higher end of event-driven strategies, but it is more discrete and cyclical.
- For fixed-income arbitrage, the attractiveness of returns is a function of the correlations between different securities, the yield spread pick-up available, and the high number and wide diversity of debt securities across different markets, each having different credit quality and convexity aspects in their pricing.

- Yield curve and carry trades within the US government space are very liquid but have the fewest mispricing opportunities. Liquidity for relative value positions generally decreases in other sovereign markets, mortgage-related markets, and across corporate debt markets.
- Fixed-income arbitrage involves high leverage usage, but leverage availability diminishes with trade and underlying instrument complexity.
- Convertible arbitrage strategies strive to extract “underpriced” implied volatility from long convertible bond holdings. To do this, managers will delta hedge and gamma trade short equity positions against their convertible positions. Convertible arbitrage works best in periods of high convertible issuance, moderate volatility, and reasonable market liquidity.
- Liquidity issues may arise from convertible bonds being naturally less-liquid securities due to their relatively small issue sizes and inherent complexities as well as the availability and cost to borrow underlying equity for short selling.
- Convertible arbitrage managers typically run convertible portfolios at 300% long vs. 200% short. The lower short exposure is a function of the delta-adjusted exposure needed from short sales to balance the long convertibles.
- Global macro strategies focus on correctly discerning and capitalizing on trends in global financial markets using a wide range of instruments. Managed futures strategies have a similar aim but focus on investments using mainly futures and options on futures, on stock and fixed-income indexes, as well as on commodities and currencies.
- Managed futures strategies typically are implemented via more systematic approaches, while global macro strategies tend to use more discretionary approaches. Both strategies are highly liquid and use high leverage.
- Returns of managed futures strategies typically exhibit positive right-tail skewness during market stress. Global macro strategies generally deliver similar diversification in stress periods but with more heterogeneous outcomes.
- Specialist hedge fund strategies require highly specialized skill sets for trading in niche markets. Two such typical specialist strategies—which are aimed at generating uncorrelated, attractive risk-adjusted returns—are volatility trading and reinsurance/life settlements.
- Volatility traders strive to capture relative timing and strike pricing opportunities due to changes in the term structure of volatility. They try to capture volatility smile and skew by using various types of option spreads, such as bull and bear spreads, straddles, and calendar spreads. In addition to using exchange-listed and OTC options, VIX futures, volatility swaps, and variance swaps can be used to implement volatility trading strategies.
- Life settlements strategies involve analyzing pools of life insurance contracts offered by third-party brokers, where the hedge fund purchases the pool and effectively becomes the beneficiary. The hedge fund manager looks for policies with the following traits: 1) The surrender value being offered to the insured individual is relatively low; 2) the ongoing premium payments are also relatively low; and 3) the probability is relatively high that the insured person will die sooner than predicted by standard actuarial methods.
- Funds-of-funds and multi-strategy funds typically offer steady, low-volatility returns via their strategy diversification. Multi-strategy funds have generally outperformed FoFs, but they have more variance due to using relatively high leverage.

- Multi-strategy funds offer potentially faster tactical asset allocation and generally improved fee structure (netting risk between strategies is often at least partially absorbed by the general partner), but they have higher manager-specific operational risks. FoFs offer a potentially more diverse strategy mix, but they have less transparency, slower tactical reaction time, and contribute netting risk to the FoF investor.
- Conditional linear factor models can be useful for uncovering and analyzing hedge fund strategy risk exposures. This reading uses such a model that incorporates four factors for assessing risk exposures in both normal periods and market stress/crisis periods: equity risk, credit risk, currency risk, and volatility risk.
- Adding a 20% allocation of a hedge fund strategy group to a traditional 60%/40% portfolio (for a 48% stocks/32% bonds/20% hedge funds portfolio) typically decreases total portfolio standard deviation while it increases Sharpe and Sortino ratios (and also often decreases maximum drawdown) in the combined portfolios. This demonstrates that hedge funds act as both risk-adjusted return enhancers and diversifiers for the traditional stock/bond portfolio.

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PRACTICE PROBLEMS

- 1 Bern Zang is the chief investment officer of the Janson University Endowment Investment Office. The Janson University Endowment Fund (the “Fund”) is based in the United States and has current assets under management of \$10 billion, with minimal exposure to alternative investments. Zang currently seeks to increase the Fund’s allocation to hedge funds and considers four strategies: dedicated short bias, merger arbitrage, convertible bond arbitrage, and global macro.

At a meeting with the Fund’s board of directors, the board mandates Zang to invest only in event-driven and relative value hedge fund strategies.

Determine, among the four strategies under consideration by Zang, the two that are permitted given the board’s mandate. **Justify** your response.

- i. Dedicated short bias
- ii. Merger arbitrage
- iii. Convertible bond arbitrage
- iv. Global macro

Determine, among the four strategies under consideration by Zang, the two that are permitted given the board’s mandate. (circle two)

Justify your response.

Dedicated short bias

Merger arbitrage

Convertible bond arbitrage

Global macro strategies

The following information relates to Questions 2 and 3

Jane Shaindy is the chief investment officer of a large pension fund. The pension fund is based in the United States and currently has minimal exposure to hedge funds. The pension fund’s board has recently approved an additional investment in a long/short equity strategy. As part of Shaindy’s due diligence on a hedge fund that implements a long/short equity strategy, she uses a conditional linear factor model to uncover and analyze the hedge fund’s risk exposures. She is interested in analyzing several risk factors, but she is specifically concerned about whether the hedge fund’s long (positive) exposure to equities increases during turbulent market periods.

- 2 **Describe** how the conditional linear factor model can be used to address Shaindy’s concern.

During a monthly board meeting, Shaindy discusses her updated market forecast for equity markets. Due to a recent large increase in interest rates and geopolitical tensions, her forecast has changed from one of modestly rising equities to several

periods of non-trending markets. Given this new market view, Shaindy concludes that a long/short strategy will not be optimal at this time and seeks another equity-related strategy. The Fund has the capacity to use a substantial amount of leverage.

- 3 Determine** the *most appropriate* equity-related hedge fund strategy that Shaindy should employ. **Justify** your response.

- 4** Gunnar Patel is an event-driven hedge fund manager for Senson Fund, which focuses on merger arbitrage strategies. Patel has been monitoring the potential acquisition of Meura Inc. by Sellshom, Inc. Sellshom is currently trading at \$60 per share and has offered to buy Meura in a stock-for-stock deal. Meura was trading at \$18 per share just prior to the announcement of the acquisition.

The offer ratio is 1 share of Sellshom in exchange for 2 shares of Meura. Soon after the announcement, Meura's share price jumps to \$22 while Sellshom's falls to \$55 in anticipation of the merger receiving required approvals and the deal closing successfully.

At the current share prices of \$55 for Sellshom and \$22 for Meura, Patel attempts to profit from the merger announcement. He buys 40,000 shares of Meura and sells short 20,000 shares of Sellshom.

Calculate the payoffs of the merger arbitrage under the following two scenarios:

- i. The merger is successfully completed.
- ii. The merger fails.

- 5** John Puten is the chief investment officer of the Markus University Endowment Investment Office. Puten seeks to increase the diversification of the endowment by investing in hedge funds. He recently met with several hedge fund managers that employ different investment strategies. In selecting a hedge fund manager, Puten prefers to hire a manager that uses the following:

- Fundamental and technical analysis to value markets
- Discretionary and systematic modes of implementation
- Top-down strategies
- A range of macroeconomic and fundamental models to express a view regarding the direction or relative value of a particular asset

Puten's staff prepares a brief summary of two potential hedge fund investments:

Hedge Fund 1: A relative value strategy fund focusing only on convertible arbitrage.

Hedge Fund 2: An opportunistic strategy fund focusing only on global macro strategies.

Determine which hedge fund would be *most appropriate* for Puten. **Justify** your response.

- 6** Yankel Stein is the chief investment officer of a large charitable foundation based in the United States. Although the foundation has significant exposure to alternative investments and hedge funds, Stein proposes to increase the foundation's exposure to relative value hedge fund strategies. As part of Stein's due diligence on a hedge fund engaging in convertible bond arbitrage, Stein asks his investment analyst to summarize different risks associated with the strategy.

Describe how each of the following circumstances can create concerns for Stein's proposed hedge fund strategy:

- i. Short selling
- ii. Credit issues

iii. Time decay of call option

iv. Extreme market volatility

**Describe how each of the following
circumstances can create concerns for Stein's
proposed hedge fund strategy:**

Short selling

Credit issues

Time decay of call option

Extreme market volatility

The following information relates to Questions 7 and 8

Sushil Wallace is the chief investment officer of a large pension fund. Wallace wants to increase the pension fund's allocation to hedge funds and recently met with three hedge fund managers. These hedge funds focus on the following strategies:

Hedge Fund A: Specialist—Follows relative value volatility arbitrage

Hedge Fund B: Multi-Manager—Multi-strategy fund

Hedge Fund C: Multi-Manager—Fund-of-funds

7 Describe three paths for implementing the strategy of Hedge Fund A.

After a significant amount of internal discussion, Wallace concludes that the pension fund should invest in either Hedge Fund B or C for the diversification benefits from the different strategies employed. However, after final due diligence is completed, Wallace recommends investing only in Hedge Fund B, noting its many advantages over Hedge Fund C.

8 Discuss two advantages of Hedge Fund B relative to Hedge Fund C with respect to investment characteristics.

9 Kloss Investments is an investment adviser whose clients are small institutional investors. Muskogh Charitable Foundation (the "Foundation") is a client with \$70 million of assets under management. The Foundation has a traditional asset allocation of 65% stocks/35% bonds. Risk and return characteristics for the Foundation's current portfolio are presented in Panel A of Exhibit 1.

Kloss' CIO, Christine Singh, recommends to Muskogh's investment committee that it should add a 10% allocation to hedge funds. The investment committee indicates to Singh that Muskogh's primary considerations for the Foundation's portfolio are that any hedge fund strategy allocation should: a) limit volatility, b) maximize risk-adjusted returns, and c) limit downside risk.

Singh's associate prepares expected risk and return characteristics for three portfolios that have allocations of 60% stocks, 30% bonds, and 10% hedge funds, where the 10% hedge fund allocation follows either an equity market-neutral, global macro, or convertible arbitrage strategy. The risk and return characteristics of the three portfolios are presented in Panel B of Exhibit 1.

Exhibit 1

Hedge Fund Strategy	SD (%)	Sharpe Ratio	Sortino Ratio	Maximum Drawdown (%)
Panel A: Current Portfolio				
N/A	8.75	0.82	1.25	16.2
Panel B: Three Potential Portfolios with a 10% Hedge Fund Allocation				
Equity market neutral	8.72	0.80	1.21	15.1
Global macro	8.55	0.95	1.35	15.0
Convertible arbitrage	8.98	0.83	1.27	20.2

Discuss which hedge fund strategy Singh should view as most suitable for meeting the considerations expressed by Muskogh's investment committee.

SOLUTIONS

1

Determine, among the four strategies under consideration by Zang, the two that are permitted given the board's mandate. (circle two)

Justify your response.

Dedicated short bias

A dedicated short bias hedge fund strategy is an example of an equity hedge fund strategy, not an event-driven or relative value strategy. Equity hedge fund strategies focus primarily on the equity markets, and the majority of their risk profiles contain equity-oriented risk. Dedicated short bias managers look for possible short selling targets among companies that are overvalued, that are experiencing declining revenues and/or earnings, or that have internal management conflicts, weak corporate governance, or even potential accounting frauds.

Merger arbitrage

A merger arbitrage hedge fund strategy is an example of an event-driven strategy, which is permitted under the board's mandate. Event-driven hedge fund strategies focus on corporate events, such as governance events, mergers and acquisitions, bankruptcy, and other key events for corporations. Merger arbitrage involves simultaneously purchasing and selling the stocks of two merging companies to create "riskless" profits.

Convertible bond arbitrage

A convertible bond arbitrage hedge fund strategy is an example of a relative value strategy, which is permitted under the board's mandate. Relative value hedge fund strategies focus on the relative valuation between two or more securities. Relative value strategies are often exposed to credit and liquidity risks because the valuation differences from which these strategies seek to benefit are often due to differences in credit quality and/or liquidity across different securities. A classic convertible bond arbitrage strategy is to buy the relatively undervalued convertible bond and take a short position in the relatively overvalued underlying stock.

Global macro

A global macro hedge fund strategy is an example of an opportunistic hedge fund strategy, not an event-driven or relative value strategy. Opportunistic hedge fund strategies take a top-down approach, focus on a multi-asset opportunity set, and include global macro strategies. Global macro managers use both fundamental and technical analysis to value markets as well as discretionary and systematic modes of implementation.

- 2 A linear factor model can provide insights into the intrinsic characteristics and risks in a hedge fund investment. Since hedge fund strategies are dynamic, a conditional model allows for the analysis in a specific market environment to determine whether hedge fund strategies are exposed to certain risks under abnormal market conditions. A conditional model can show whether hedge fund risk exposures to equities that are insignificant during calm periods become significant during turbulent market periods. During normal periods when equities are rising, the desired exposure to equities (S&P 500 Index) should be long (positive) to benefit from higher expected returns. However, during crisis periods when equities are falling sharply, the desired exposure to equities should be short (negative).

- 3 Shaindy should employ an equity market-neutral (EMN) equity strategy. Overall, EMN managers are more useful for portfolio allocation during periods of non-trending or declining markets. EMN hedge fund strategies take opposite (long and short) positions in similar or related equities having divergent valuations while attempting to maintain a near net zero portfolio exposure to the market. EMN managers neutralize market risk by constructing their portfolios such that the expected portfolio beta is approximately equal to zero. Moreover, EMN managers often choose to set the betas for sectors or industries as well as for common risk factors (e.g., market size, price-to-earnings ratio, and book-to-market ratio) equal to zero. Since these portfolios do not take beta risk and attempt to neutralize many other factor risks, they typically must apply leverage to the long and short positions to achieve a meaningful return profile from their individual stock selections.

EMN strategies typically deliver return profiles that are steadier and less volatile than those of many other hedge strategy areas. Over time, their conservative and constrained approach typically results in a less dynamic overall return profile than those of managers who accept beta exposure. Despite the use of substantial leverage and because of their more standard and overall steady risk/return profiles, equity market-neutral managers are often a preferred replacement for fixed-income managers during periods when fixed-income returns are unattractively low.

- 4
- i. At the current share prices of \$55 for Sellshom and \$22 for Meura, Patel would receive \$1,100,000 from short selling 20,000 shares of Sellshom and would pay \$880,000 to buy 40,000 shares of Meura. This provides a net spread of \$220,000 to Patel if the merger is successfully completed.
 - ii. If the merger fails, then prices should revert back to their pre-merger announcement levels of \$18 per share for Meura and \$60 per share for Sellshom. The manager would need to buy back 20,000 shares of Sellshom at \$60 per share, for a total of \$1,200,000, to close the short position. Patel would then sell the long position of 40,000 shares of Meura at \$18 per share for a total of \$720,000. This net loss would be \$260,000, calculated as: (Sellshom: \$1,100,000 – \$1,200,000 = –\$100,000) + (Meura: –\$880,000 + \$720,000 = –\$160,000).
- 5 Hedge Fund 2 would be most appropriate for Puten because it follows a global macro strategy, which is consistent with Puten's preferences. Global macro managers use both fundamental and technical analysis to value markets, and they use discretionary and systematic modes of implementation. The key source of returns in global macro strategies revolves around correctly discerning and capitalizing on trends in global markets.

Global macro strategies are typically top-down and employ a range of macro-economic and fundamental models to express a view regarding the direction or relative value of a particular asset or asset class. Positions may comprise a mix of individual securities, baskets of securities, index futures, foreign exchange futures/forwards, fixed-income products or futures, and derivatives or options on any of the above. If the hedge fund manager is making a directional bet, then directional models will use fundamental data regarding a specific market or asset to determine if it is undervalued or overvalued relative to history and the expected macro-trend.

Hedge Fund 1 follows a relative value strategy with a focus on convertible arbitrage, which is not aligned with Puten's preferences. In a convertible bond arbitrage strategy, the manager strives to extract "cheap" implied volatility by buying the relatively undervalued convertible bond and taking a short position

in the relatively overvalued common stock. Convertible arbitrage managers are typically neither using fundamental and technical analysis to value markets nor employing top-down strategies to express a view regarding the direction or relative value of an asset.

6

Describe how each of the following circumstances can create concerns for Stein's proposed hedge fund strategy:	
Short selling	Since Hedge Fund 1 employs a convertible arbitrage strategy, the fund buys the convertible bond and takes a short position in the underlying security. When short selling, shares must be located and borrowed; as a result, the stock owner may want his/her shares returned at a potentially inopportune time, such as during stock price run-ups or when supply for the stock is low or demand for the stock is high. This situation, particularly a short squeeze, can lead to substantial losses and a suddenly unbalanced exposure if borrowing the underlying equity shares becomes too difficult or too costly for the arbitrageur.
Credit issues	Credit issues may complicate valuation since bonds have exposure to credit risk. When credit spreads widen or narrow, there would be a mismatch in the values of the stock and convertible bond positions that the convertible manager may or may not have attempted to hedge away.
Time decay of call option	The convertible bond arbitrage strategy can lose money due to time decay of the convertible bond's embedded call option during periods of reduced realized equity volatility and/or due to a general compression of market implied volatility levels.
Extreme market volatility	Convertible arbitrage strategies have performed best when convertible issuance is high (implying a wider choice among convertible securities as well as downward price pressure and cheaper prices), general market volatility levels are moderate, and the liquidity to trade and adjust positions is sufficient. Extreme market volatility typically implies heightened credit risks. Convertibles are naturally less-liquid securities, so convertible managers generally do not fare well during such periods. Because hedge funds have become the natural market makers for convertibles and typically face significant redemption pressures from investors during crises, the strategy may have further unattractive left-tail risk attributes during periods of market stress.

- 7 Hedge Fund A's volatility trading strategy can be implemented by following multiple paths. One path is through simple exchange-traded options. The maturity of such options typically extends to no more than two years. In terms of expiry, the longer-dated options will have more absolute exposure to volatility levels than shorter-dated options, but the shorter-dated options will exhibit more delta sensitivity to price changes.

A second, similar path is to implement the volatility trading strategy using OTC options. In this case, the tenor and strike prices of the options can be customized. The tenor of expiry dates can then be extended beyond what is available with exchange-traded options.

A third path is to use VIX futures or options on VIX futures as a way to more explicitly express a pure volatility view without the need for constant delta hedging of an equity put or call for isolating the volatility exposure.

A fourth path for implementing a volatility trading strategy would be to purchase an OTC volatility swap or a variance swap from a creditworthy counterparty. A volatility swap is a forward contract on future realized price volatility. Similarly, a variance swap is a forward contract on future realized price variance, where variance is the square of volatility. Both volatility and variance swaps provide "pure" exposure to volatility alone, unlike standardized options in which the volatility exposure depends on the price of the underlying asset and must be isolated and extracted via delta hedging.

- 8 a** Multi-strategy managers like Hedge Fund B can reallocate capital into different strategy areas more quickly and efficiently than would be possible by a fund-of-funds (FoF) manager like Hedge Fund C. The multi-strategy manager has full transparency and a better picture of the interactions of the different teams' portfolio risks than would ever be possible for FoF managers to achieve. Consequently, the multi-strategy manager can react faster to different real-time market impacts—for example, by rapidly increasing or decreasing leverage within different strategies depending upon the perceived riskiness of available opportunities.
- b** The fees paid by investors in a multi-strategy fund can be structured in a number of ways, some of which can be very attractive when compared to the FoFs' added fee layering and netting risk attributes. Conceptually, FoF investors always face netting risk, whereby they are responsible for paying performance fees due to winning underlying funds while suffering return drag from the performance of losing underlying funds. Even if the FoF's overall performance is flat or down, FoF investors must still pay incentive fees due to the managers of winning funds.
- 9** Based on the investment committee's considerations, Singh should view a 10% allocation to the global macro hedge fund strategy as most suitable for the Foundation. Such an allocation would result in a decrease in standard deviation (volatility) and significant increases in the combined portfolio's Sharpe and Sortino ratios (these are the highest such ratios among the strategies presented). In addition, the lower maximum drawdown (15.0%) indicates less downside risk in the combined portfolio than with any of the other strategy choices.

READING

27

Asset Allocation to Alternative Investments

by Adam Kobor, PhD, CFA, and Mark D. Guinney, CFA

Adam Kobor, PhD, CFA, is at New York University (USA). Mark D. Guinney, CFA (USA).

LEARNING OUTCOMES

<i>Mastery</i>	<i>The candidate should be able to:</i>
<input type="checkbox"/>	a. explain the roles that alternative investments play in multi-asset portfolios;
<input type="checkbox"/>	b. compare alternative investments and bonds as risk mitigators in relation to a long equity position;
<input type="checkbox"/>	c. compare traditional and risk-based approaches to defining the investment opportunity set, including alternative investments;
<input type="checkbox"/>	d. discuss investment considerations that are important in allocating to different types of alternative investments;
<input type="checkbox"/>	e. discuss suitability considerations in allocating to alternative investments;
<input type="checkbox"/>	f. discuss approaches to asset allocation to alternative investments;
<input type="checkbox"/>	g. discuss the importance of liquidity planning in allocating to alternative investments;
<input type="checkbox"/>	h. discuss considerations in monitoring alternative investment programs.

INTRODUCTION

1

Asset allocation is a critical decision in the investment process. The mathematical and analytical processes inherent in contemporary asset allocation techniques are complicated by the idiosyncrasies of alternative investments. Approaches to incorporating alternative assets into the strategic asset allocation have developed rapidly as allocations to assets other than stocks and bonds have accelerated in the aftermath of the 2008 Global Financial Crisis. The term “alternative” understates the prominence of alternative investment allocations in many investment programs, because institutional and private clients have been increasingly turning to these investments not just to

supplement traditional long-only stocks and bonds but also sometimes to replace them altogether. For example, the Yale Endowment and the Canada Pension Plan Investment Board both have close to 50% of their assets allocated to alternatives.¹ Although these two funds are admittedly outliers, between 2008 and 2017 most of the pension funds around the world substantially expanded their allocations to alternative asset classes. On average, pension funds in developed markets increased their allocation from 7.2% to 11.8% of assets under management (AUM) in 2017, a 63% increase.²

“Alternative” investment has no universally accepted definition. For the purposes of this reading, alternative investments include private equity, hedge funds, real assets (including energy and commodity investments), commercial real estate, and private credit.

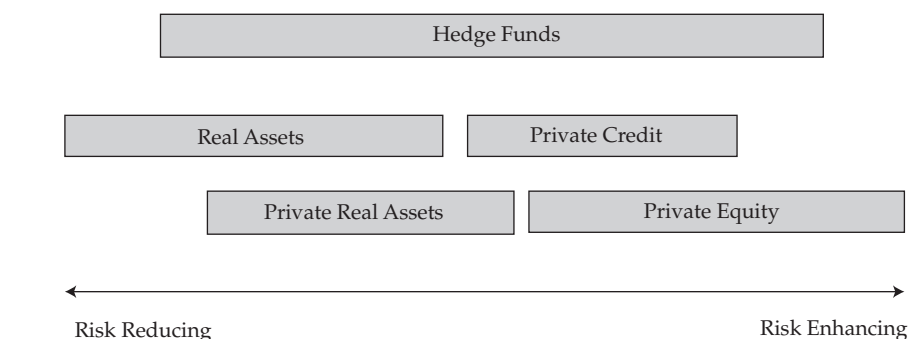
The reading begins with a discussion of the role alternative assets play in a multi-asset portfolio and explores how alternatives may serve to mitigate long-only equity risk, a role traditionally held by bonds. We then consider different ways investors may define the opportunity set—through the traditional asset class lens or, more recently, using a risk- or factor-based lens. An allocation to alternatives is not for all investors, so the reading describes issues that should be addressed when considering an allocation to alternatives. We then discuss approaches to asset allocation when incorporating alternatives in the opportunity set and the need for liquidity planning in private investment alternatives. Finally, the reading discusses the unique monitoring requirements for an alternatives portfolio.

2

THE ROLE OF ALTERNATIVE INVESTMENTS IN A MULTI-ASSET PORTFOLIO

Allocations to alternatives are playing an increasing role in investor portfolios largely driven by the belief that these investments increase the risk-adjusted return expectations for their programs. Some allocations are driven by expectations of higher returns, while others are driven by the expected diversification (risk-reduction) benefits. In the aggregate, the portfolio's *risk-adjusted* return is expected to improve. Exhibit 1 provides a framework for how the common alternative strategies are generally perceived to affect the risk/return profile of a “typical” 60/40 portfolio of public stocks and bonds.

Exhibit 1 Alternative Investments in the Risk/Reward Continuum



¹ Boston Consulting Group (BCG), “The Rise of Alternative Assets and Long-Term Investing (March 2017).

² See Ivashina and Lerner 2018.

Although we present a simplified view, real assets are generally believed to mitigate the risks to the portfolio arising from unexpected inflation. At the other end of the spectrum, venture capital investments (private equity) are expected to provide a sufficient return premium over public equities to compensate for their illiquidity risk and heightened operational complexity. Hedge funds, the least homogenous of strategies, span the spectrum from “risk reducing” or diversifying (many arbitrage strategies) to “return enhancing” (e.g., an activist fund that takes significant positions in public companies with the goal of improving performance through management changes, capital allocation policies, and/or company strategy).

Risk reduction can mean different things to different investors. Institutions may choose to add non-correlated strategies to their portfolios to reduce the volatility of the overall investment program. Private clients are frequently concerned with reducing only downside volatility—the “left tail” risk associated with significant public equity market drawdowns. An insurance pool whose liabilities are sensitive to inflation might benefit from real assets that could reduce its asset–liability mismatch. Exhibit 2 provides some guidance as to how an allocator might view alternative assets vis-à-vis traditional asset classes.

Exhibit 2 Illustrative Capital Market Assumptions

	Traditional Assets				Alternative Assets					
	Public Equities	Cash	Govt Bonds	Broad Fixed Income	Private Credit	Hedge Funds	Commodities	Public Real Estate	Private Real Estate	Private Equity
Expected Return (Geometric Average)	6.5%	2.0%	2.3%	2.8%	6.5%	5.0%	4.5%	6.0%	5.5%	8.5%
Volatility	17.0%	1.1%	4.9%	3.4%	10.0%	8.1%	25.2%	20.4%	13.8%	15.7%
Correlation with Equities	1.00	−0.12	−0.60	−0.41	0.70	0.83	0.21	0.60	0.37	0.81
Equity Beta	1.00	−0.01	−0.17	−0.08	0.40	0.40	0.31	0.72	0.30	0.74

Source: Authors' own data.

In the context of asset allocation, investors may categorize an asset class based on the role it is expected to play in the overall portfolio. The roles and their relative importance will vary among investors, but it is common to identify the following functional roles:

- **Capital growth:** This role may be a top priority for portfolios with a long-term time horizon and relatively high-return target. Usually, public and private equity investments would be the most obvious choices for this role.
- **Income generation:** Certain asset classes, like fixed income or real estate, are capable of generating reasonably steady cash flow stream for investors.

- *Risk diversification*: In the case of an equity-oriented portfolio, investors may seek assets that diversify the dominant equity risk. Real assets and several hedge fund strategies may fit here. Similarly, fixed-income investors may be interested in diversifying pure yield curve risk via private credit.
- *Safety*: Certain asset classes may play the role of safe haven when most of the risky asset classes suffer. Government bonds or gold may potentially play such roles in a well-diversified portfolio.

Exhibit 3 illustrates how each of the alternative assets is generally perceived to fulfill these functional roles.

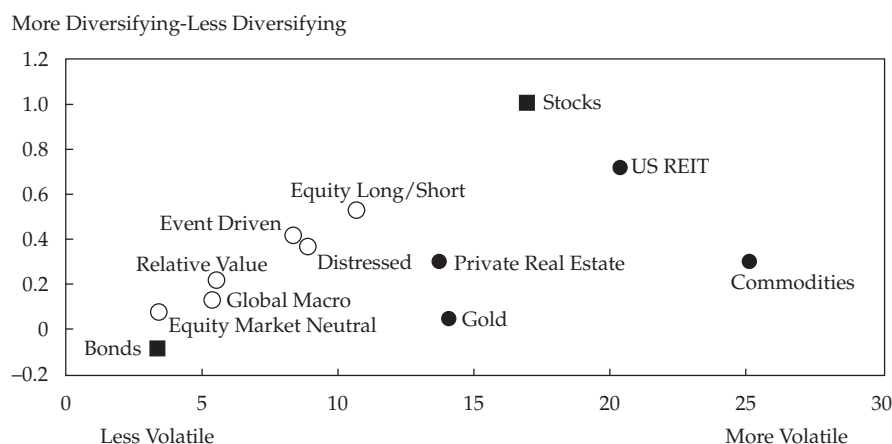
Exhibit 3 The Role of Asset Classes in a Multi-Asset Portfolio

Asset Class		Role			
		Capital Growth	Income	Diversifying Public Equities	
				Equities	Safety
Fixed Income and Credit	Governments		M	H	H
	Inflation-Linked		M	H	H/M
	Inv.-Grade Credit		M	H	M
	High-Yield Credit		H	M	
	Private Credit		H	M	
Equities	Public Equity	H	M		
	Private Equity	H	M	M	
Real Estate	Public Real Estate	M	H	M	
	Private Real Estate	M	H	M	
Real Assets	Public Real Assets (Energy, Metal, etc.)			H	
	Private Real Assets (Timber, etc.)	H	H	H	
Hedge Funds	Absolute Return		M	H	
	Equity Long/Short			M	

Notes: H = high/strong potential to fulfill the indicated role; M = moderate potential to fulfill the indicated role.

Exhibit 4 illustrates the potential contributions the various alternative strategies might make to a portfolio dominated by equity risk. Note that the graph illustrates the *average* investment characteristics of each asset class over some extended period of time. Some assets—gold, for example—may not consistently exhibit attractive *aggregate* characteristics compared to other strategies but may serve the portfolio well during many major market shocks.

Exhibit 4 Diversification Potential of Various Alternative Asset Classes



Sources: Bloomberg and authors' own data and calculations.

2.1 The Role of Private Equity in a Multi-Asset Portfolio

Private equity investments are generally viewed as a return enhancer in a portfolio of traditional assets. The expectation for a return premium over public equities stems from the illiquidity risk that comes with most forms of private equity investment. Because of the strong link between the fundamentals of private and public companies, there are limited diversification benefits when added to a portfolio that otherwise contains significant public equity exposure. Private equity volatility is not directly observable because holdings are not publicly traded. Assets tend to be valued at the lower of cost or the value at which the company raises additional capital or when ownership changes hands (e.g., through an initial public offering or a sale to a strategic buyer or to another private equity sponsor). Consequently, private equity indexes do not provide a true picture of the strategy's risk. For asset allocation exercises, volatility is often estimated using a public equity proxy with an adjustment to better represent the nature of the private equity program. For example, a proxy for early stage venture capital might be microcap technology companies. A proxy for buyout funds might start with the volatility of a geographically relevant large-cap equity index (e.g., S&P 500, Nikkei), which is then adjusted for relative financial leverage.

2.2 The Role of Hedge Funds in a Multi-Asset Portfolio

As illustrated in Exhibit 1, hedge funds span the spectrum from being risk reducers to return enhancers. Generally speaking, long/short equity strategies are believed to deliver equity-like returns with less than full exposure to the equity premium but with an additional source of return that might come from the manager's shorting of individual stocks. Short-biased equity strategies are expected to lower a portfolio's overall equity beta while producing some measure of alpha. Arbitrage and event-driven strategies, executed properly, look to exploit small inefficiencies in the public markets while exhibiting low to no correlation with traditional asset classes. However, most hedge fund arbitrage strategies involve some degree of "short volatility" risk. Because of this "short volatility" risk, the volatility in an arbitrage strategy is non-symmetrical; the aggregate volatility may look muted if the period from which the data are drawn does

not include a market stress period. “Opportunistic” strategies (e.g., global macro and managed futures), although very volatile as stand-alone strategies, provide exposures not otherwise readily accessible in traditional stock and bond strategies.

2.3 The Role of Real Assets in a Multi-Asset Portfolio

This category includes timber, commodities, farmland, energy, and infrastructure assets. The common thread for these investments is that the underlying investment is a physical asset with a relatively high degree of correlation with inflation broadly or with a sub-component of inflation, such as oil (energy funds), agricultural products (farmland), or pulp and wood products (timber).

Timber investments provide both growth and inflation-hedging properties in a multi-asset portfolio. Growth is provided through the biological growth of the tree itself as well as through the appreciation in the underlying land value. Timber’s inflation-hedging characteristics are derived from the unique nature in which the value of the asset is realized: If the market for timber products is weak, the owner of the asset can leave it “on the stump” waiting for prices to rise. While waiting, the volume of the asset increases—the tree continues to grow—and there is ultimately more of the asset to sell when prices recover. At the same time, the volatility of the timber asset rises; the market for more mature timber is more volatile, and the potential loss from pests and natural disasters rises.

Commodities investments (i.e., tradable commodities) fall into the following four categories:

- Metals (gold, silver, platinum, copper)
- Energy (crude oil, natural gas, heating oil, gasoline)
- Livestock and Meat (hogs, pork bellies, live cattle)
- Agricultural (corn, soybeans, wheat, rice, cocoa, coffee, cotton, sugar)

Although it is possible to own the commodity asset directly (e.g., corn, wheat, barrel of oil), most investors will invest in commodity derivatives (i.e., futures contracts) whose price is directly related to the price of the physical commodity. Investors generally own commodities as a hedge against a core constituent of inflation measures as well as a differentiated source of alpha. Gold and other precious metals are frequently owned directly because they are thought to be a good store of value in the face of a depreciating currency. Storage and insurance costs come with owning commodities directly.

Farmland investing involves two primary approaches. The higher return/risk strategy involves owning the farmland while providing the farmer a salary for tending and selling the crops. The investor retains the commodity risk and the execution risk. This approach requires a long time horizon and has high sensitivity to natural disasters and regulatory risk, such as trade disputes. In the other main approach, the investor owns the farmland but leases the property to the farmer. The farmer retains the risk for execution and commodity prices. If an investor pursues this second strategy, farmland is more like core commercial real estate investing than a real asset (commodity) strategy.

Energy investments consist of strategies that focus on the exploration, development, transportation, and delivery of energy (primarily oil and natural gas-based energy sources but also increasingly wind, hydroelectric, and solar) as well as all the ancillary services that facilitate energy production. Investors usually do not own the land that holds the minerals. Most energy investments are executed through call-down, private equity-style funds and are usually long-dated, illiquid holdings. Energy assets are generally considered real assets because the investor owns the mineral rights to certain commodities (e.g., natural gas, oil, methane) that can be correlated with certain inflationary factors. Master limited partnerships (MLPs) are another frequently used

vehicle for energy investments. MLPs generally construct and own the pipelines that carry oil or natural gas from the wellhead to the storage facility. MLPs rarely take ownership of the energy assets. The companies charge a fee based on the volume of oil/natural gas they transport. This fee is often pegged to the Producer Price Index.

Infrastructure is a strategy that typically involves the construction and maintenance of public-use projects, such as building bridges, toll roads, or airports. Because of the illiquid nature of these assets, the holding period associated with these funds can be even longer than the typical illiquid strategy, with some lasting 20 years or longer. These assets tend to generate stable or modestly growing income, and the asset itself often requires minimal upkeep or capital expenditures once built. The revenue generated by the assets tends to have high correlation with overall inflation, though it is often subject to regulatory risks because governmental agencies may be involved in price setting with certain jurisdictions and assets.

2.4 The Role of Commercial Real Estate in a Multi-Asset Portfolio

Real estate investing involves the development, acquisition, management, and disposition of commercial properties, including retail, office, industrial, housing (including apartments), and hotels. Strategies range from *core*, the ownership of fully occupied properties and collecting rents, to *opportunistic*, ground-up property development (land acquisition, construction, and sale) and/or the purchase of distressed assets with the intent to rehabilitate them.

Real estate investments are believed to provide protection against unanticipated increases in inflation. Two fundamental attributes of real estate investment contribute to this inflation protection. Well-positioned properties frequently have the ability to increase rents in response to inflationary pressures, and the value of the physical buildings may increase with inflation (properties are often valued as a function of replacement cost). In this way, real estate contributes both income and capital gain potential to a portfolio. Building a diversified private commercial real estate program can be challenging for all but the largest and most sophisticated allocators. The public real estate market is a fraction of the size of the private real estate market, but it may be easier and cheaper to build a diversified real estate investment program in some geographies (e.g., United States, Europe) via the public markets. However, private real estate can offer exposures that are difficult if not impossible to achieve through publicly-traded real estate securities. Investing directly (or in a private fund) offers customization by geography, property type, and strategy (e.g., distressed, core, development).

2.5 The Role of Private Credit in a Multi-Asset Portfolio

Private credit includes distressed investment and direct lending. Although both strategies involve the ownership of fixed-income assets, their roles in an investment program are quite different. Direct-lending assets are income-producing, and the asset owner assumes any default or recovery risks. Direct-lending assets generally behave like their public market counterparts with similar credit profiles (i.e., high-quality, direct-lending assets behave like investment-grade bonds, and low-quality, direct-lending assets behave like high-yield bonds). Distressed debt assets have a more equity-like profile. The expected return is derived from the value of a company's assets relative to its debt. Illiquidity risks are high with both strategies. Direct-lending assets have no secondary market.

Direct-lending funds provide capital to individuals and small businesses that generally cannot access more traditional lending channels. Some loans are unsecured while others might be backed by an asset, such as a house or car. Direct lending is one of the least liquid debt strategies because there is typically no secondary market for these instruments. Investors in direct-lending strategies gain access to a high-yielding but riskier segment of the debt market that is not available via the traditional public markets.

Distressed funds typically purchase the securities of an entity that is under stress and where the stress is relieved through legal restructuring or bankruptcy. The investment can take the form of debt or equity, and in many strategies, the manager often takes an active role throughout the restructuring or bankruptcy. Because many investors are precluded from owning companies or entities that are in bankruptcy or default, managers of distressed funds are often able to purchase assets (usually the debt) at a significant discount. Experience with the bankruptcy process frequently distinguishes these managers from others. Although the asset is usually a bond, distressed investments typically have low sensitivity to traditional bond risks (i.e., interest rate changes or changes in spreads) because the idiosyncratic risk of the company itself dominates all other risks.

3

DIVERSIFYING EQUITY RISK

In this section, we examine the claim that alternative assets may be better risk mitigators than government bonds. To address this question, we must agree on *which* risks alternatives are said to mitigate and on *what* time horizon is relevant. If your investment horizon is short term, volatility may be the most important risk measure. If you are a long-term investor, not achieving the long-horizon return objective may be the most relevant concern.

3.1 Volatility Reduction over the Short Time Horizon

Let's look first at the short horizon investor and consider how alternative asset classes compare to bonds as a volatility reducer in an equity-dominated portfolio. Advocates of alternative investments as risk reducers sometimes argue that alternative investments' volatilities calculated based on reported returns are significantly lower than the volatility of public equities. An immediate technical challenge is that reported returns of many alternative asset classes need an adjustment called **unsmoothing** for proper risk estimation. (Various approaches have been developed to unsmooth a return series that demonstrates serial correlation. The specifics of those approaches are beyond the scope of this reading.) In the case of private investments, reported returns are calculated from appraisal-based valuations that may result in volatility and correlation estimates that are too low. (The underlying assumptions in most appraisal models tend to lead to gradual and incremental changes in appraised value that may not accurately capture the asset's true price realized in an actual transaction. The low volatility of the return stream may also dampen the reported correlation between the appraisal-based asset and the more volatile market-based asset.) Other factors may also contribute to underestimated risk across alternatives. For example, **survivorship bias** and **back-fill bias** (reporting returns to a database only after they are known to be good returns) in hedge fund databases can potentially lead to an understatement of downside risk. Additionally, a hedge fund "index" includes many managers whose

returns exhibit low correlation; in the same way that combining stocks and bonds in a portfolio can be expected to lower overall portfolio volatility, so too does combining several hedge funds into an “index.”

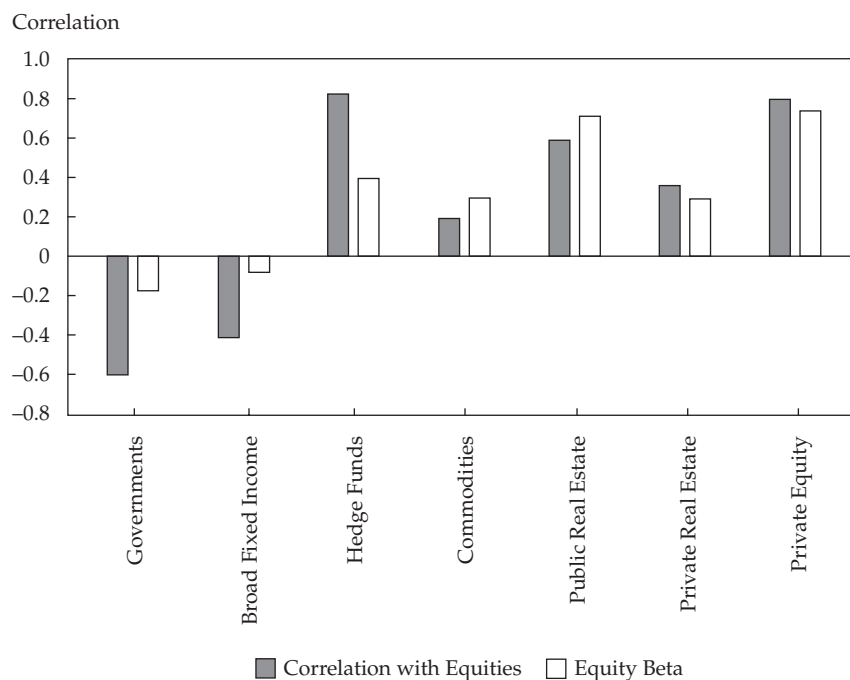
As an example, we build a hypothetical, equally-weighted index of long/short equity hedge funds with volatilities ranging from 6% to 11%. As shown in Exhibit 5, given the less-than-perfect correlation among the constituents of our index, the index volatility is only 4.9%:

Exhibit 5 Volatility Is Less Than the Sum of Its Parts

	Fund 1	Fund 2	Fund 3	Fund 4	Fund 5	Combined
Volatility	10.9%	6.5%	8.5%	9.7%	8.1%	4.9%
Correlation						
Fund 1		−0.02	0.14	0.00	0.15	
Fund 2			0.27	0.39	0.29	
Fund 3				0.25	−0.03	
Fund 4					0.14	

Exhibit 6 shows the correlations of fixed-income and alternative asset classes to public equities based on observed market data over 1997–2017. We also show each asset class’s estimated equity beta. To estimate correlations and betas, we used unsmoothed return data for alternative asset classes. We discuss unsmoothing of returns in more detail in a later section.

Exhibit 6 Fixed-Income’s and Alternative’s Equity Beta and Correlation with Equities



Sources: Bloomberg and authors’ own data and calculations.

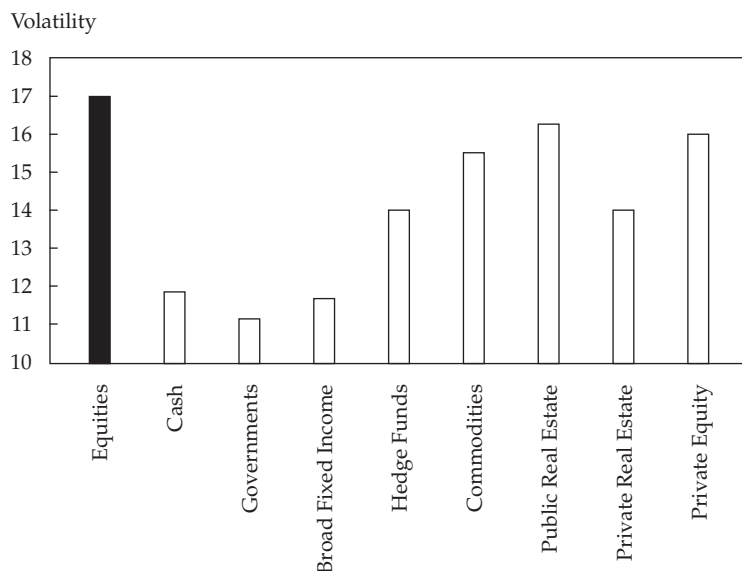
Most of the alternative investment categories had positive, but less than perfect, correlation with equities. Although certain alternatives (e.g., commodities, particularly gold) may rally during a public equity market downturn, other alternative investments—like hedge funds, private credit, or private equities—also experience drawdowns at the same time the equity market falls. Hedge funds and private equities have a correlation coefficient with equities over +0.8, and this indicates a fairly strong positive relationship between public equities and these alternative investments.

Government bonds, however, have a −0.6 estimated correlation with equities, which indicates a negative relationship of moderate strength. This is consistent with the tendency for government bonds to serve as a risk haven during “risk-off” or “flight to quality” episodes.

Although correlation and beta have the same sign and are statistically interrelated, we have to remember that they quantify two different things. The correlation coefficient quantifies the strength of a linear relationship between two variables, thus playing a crucial role in portfolio diversification: The lower the correlation, the stronger the asset’s diversification power. Beta, however, measures the response of an asset to a unit change in a reference index; for example, equity beta measures how various assets would respond to a 1% rise of public equities. Hedge funds’ beta is estimated at around 0.4; thus, we would expect a 0.4% return (excluding manager alpha) from hedge funds if equities rose by 1%. Hedge funds’ relatively low beta (0.4) and high correlation (+0.8) means that hedge funds’ rise or fall is milder than those of public equities in magnitude, but this directional relationship is fairly strong in a statistical sense. Commodities also have an equity beta of similar positive magnitude (0.3), but their correlation with equities is much weaker (+0.2); so, we can expect that a much bigger portion of commodity price changes would be driven by factors unrelated to the equity markets.

In Exhibit 7, we compare the total return volatility of public equities (black bar) with volatilities of portfolios comprised of 70% equity and 30% other asset classes. Using 20 years of data, the volatility of public equities is estimated at approximately 17%. A portfolio allocated 70% to equity and 30% to cash would imply a portfolio volatility of 11.9% ($70\% \times 17\%$). Portfolios of 70% equities and 30% any of the alternative asset classes also reduces portfolio volatility relative to an all-equity portfolio, but the lowest volatility of 11.1% could be achieved by combining equities with government bonds because of the negative correlation between these two asset classes.

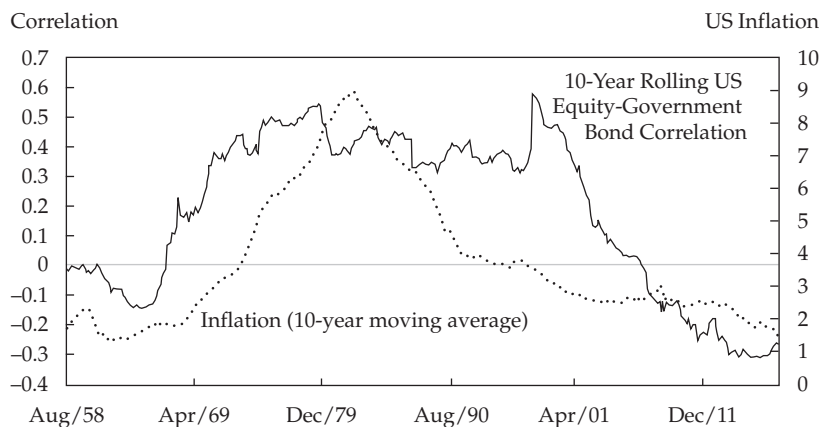
Exhibit 7 Volatility of Portfolios Comprised of 70% Equities and 30% Other Asset Class



Sources: Bloomberg and authors' own data and calculations.

Bear in mind, however, that this analysis is based on 20 years of returns ending in 2017, a period that was characterized by a persistent negative equity–bond correlation. Because there was limited inflation in developed markets over this period, economic growth prospects were the dominant influence on asset prices. Positive growth surprises are good for equities (better earnings outlook) and negative for bonds (potential central bank rate increases). If inflation becomes a threat, bonds' risk mitigation power could erode. Exhibit 8 looks at the US equity–bond correlation since the 1950s. As the chart suggests, the correlation between US equities and government bonds was, in fact, positive in the 1970s through the 1990s when inflation was also more elevated.

Exhibit 8 Long-Term Historical Equity–Bond Correlation and Inflation

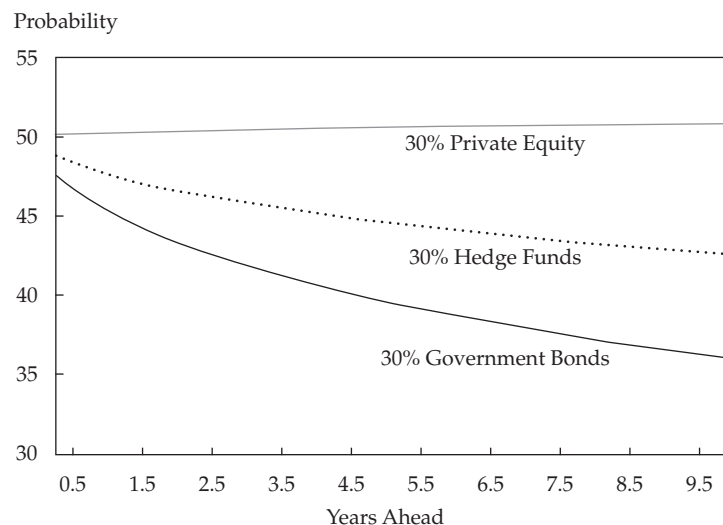


Sources: Bloomberg and the authors' own data and calculations.

3.2 Risk of Not Meeting the Investment Goals over the Long Time Horizon

Volatility is not always the most relevant risk measure. An endowment portfolio is often focused on generating a total return equal to at least the spending rate, say 5%, plus inflation to preserve real value of capital over a long time horizon. When bond yields are very low, the likelihood of meeting the investment objective would be reduced given a heavy allocation to bonds, simply because the portfolio's value would likely grow more slowly than the rate implied by the spending rate and inflation. Exhibit 9 illustrates this point: We show the probability of achieving a 5% real (7.1% nominal³) return over various horizons up to 10-years for three 70% equity/30% other asset class portfolios. We used quarterly rebalancing. Although allocating the 30% "other" to government bonds would lead to the greatest reduction in portfolio volatility, government bonds also have lower expected return compared to hedge funds and private equity (see Exhibit 2).

Exhibit 9 The Probability of Achieving Investment Objectives over the Longer Time Horizon



Note: Portfolios comprised of 70% equities and 30% other asset classes.

Source: Authors' calculations.

The 70% public equities/30% government bond portfolio has an expected return of 5.7%⁴, below the nominal return target of 7.1%. The 70% public equities/30% private equities portfolio has an expected geometric return of 7.2%, slightly over the return target. Both portfolios' expected returns are 50th percentile returns; there is a 50% probability that this is the return that would be realized over time. Thus, the 70% public equities/30% private equities portfolio, with a nominal expected return of 7.2%, has slightly better than a 50% probability of meeting the 7.1% nominal return target. The 70% public equities/30% government bond portfolio, with an expected return less than the nominal return target, therefore has less than a 50% probability of

³ By using the Fisher equation to combine the 5% real return and 2% inflation: $(1 + 5\%) * (1 + 2\%) - 1 = 7.1\%$.

⁴ Note that geometric expected return is approximated as the expected arithmetic return minus half of the investment's variance. Thus, portfolio expected geometric return is not simply the weighted average of the asset classes' expected geometric returns because portfolio variance benefits from diversification.

meeting the required return. Why does the 70% public equities/30% private equities portfolio maintain its 50%+ probability of meeting the return target over time while the probability that the 70% public equities/30% government bond portfolio meets the return target declines over time? As the time horizon lengthens, return accumulation (compounding) becomes more and more important. In a simplified way, return accumulates proportionally with time, whereas volatility scales with the square root of time. Thus, as we lengthen the time horizon, the gap between the cumulative return target and the expected return accumulation widens faster than the range of possible portfolio return outcomes. As a result, the likelihood of a low-returning portfolio catching up to the target return declines over time.

To summarize, bonds have been a more effective volatility mitigator than alternatives over shorter time horizons, but over long horizons, a heavy allocation to bonds would reduce the probability of achieving the investment goal. It is important to emphasize that volatility and the probability of achieving the target return are two very different dimensions of risk. Volatility addresses interim fluctuations in portfolio return, whereas achieving a return target takes on increasing importance as we expand the time horizon over multiple years. Both risks are important, especially for a program that is distributing 7% of assets per year as in this example. Although the 30% allocation to private equity increases the chance of meeting the expected return, a severe and sustained short-term drawdown in the public equity markets could significantly handicap the fund's ability to achieve its long-term return objectives. This is why drawdowns (related to volatility) need to be considered and managed.

EXAMPLE 1

Mitigating Equity Risk by Allocating to Hedge Funds or Bonds

The investment committee of a major foundation is concerned about high equity valuations and would like to increase the allocation either to hedge funds or to high-grade, fixed-income assets to diversify equity risk. As the risk manager of this foundation:

- 1 Discuss the justifications and the limitations of using bonds to mitigate equity risk.
- 2 Discuss the justifications and the limitations of using hedge funds to mitigate equity risk.

Solution to 1:

- Supporting argument: Bonds have exhibited negative correlation and beta to equities in a low inflation environment, so as long as inflation stays at or below average historical levels, this negative equity–bond correlation should lead to the highest reduction in portfolio volatility.
- Limitations: The negative stock/bond correlation may be temporary, and amid high inflation the stock/bond correlation could turn positive. Furthermore, if bonds' expected return is low, a heavy allocation to bonds may reduce the probability of achieving the foundation's long-term return objectives.

Solution to 2:

- Supporting argument: With a net equity beta of around 0.3–0.4 (see Exhibit 5), hedge funds would reduce an equity-dominated portfolio's overall beta. With higher expected returns than bonds, an allocation to hedge funds would make achieving the long-term return target more feasible.
- Limitations: Although a well-constructed hedge fund portfolio may reduce portfolio volatility and beta, hedge funds are often highly actively managed, levered investment strategies, and individual hedge funds may suffer significant and permanent losses during turbulent times.

4**PERSPECTIVES ON THE INVESTMENT OPPORTUNITY SET**

In this section, we consider how traditional approaches to asset allocation can be adapted to include alternative investments and how investors can apply risk-based approaches to incorporate alternatives in their asset allocation. This reading extends the asset allocation framework introduced in earlier readings on asset allocation. Although the ultimate goal of meeting the investment objectives subject to the relevant constraints remains the same, investors often face several analytical and operational challenges when introducing alternative asset classes.

4.1 Traditional Approaches to Asset Classification

When defining asset classes for the traditional approaches to asset allocation, investors may group and classify alternative assets along several dimensions. Two common approaches (in addition to the growth–income–diversification–safety roles described earlier) are with respect to the liquidity of the asset class and with respect to asset behavior under various economic conditions.

4.1.1 A Liquidity-Based Approach to Defining the Opportunity Set

Certain alternative investments, like REITs or commodity futures, are highly liquid and can be easily traded in public markets. Private investments, however, are highly illiquid and usually require long-term commitments (more than 10 years) from the investors. Of course, there are differences among various private asset classes in this respect as well: Private equity investments may require longer than a 10-year commitment, while the term of a private credit fund can be shorter, say 5 to 8 years. Although public equity and private equity may be similar asset classes from the fundamental economic point of view, they differ significantly in their liquidity characteristics.

The long investment horizon and the lack of liquidity in many of the alternative asset classes make it difficult to accurately characterize their risk characteristics for purposes of the asset allocation exercise. One approach to dealing with this issue is to make the initial asset allocation decision using only the broad, liquid asset classes in which the underlying data that drive risk, return, and correlation assumptions are robust (e.g., stocks, bonds, and real estate). A second iteration of the asset allocation exercise would break the equity/fixed-income/real estate asset allocation down further by using the asset groupings as shown in Exhibit 10, which illustrates a possible categorization of asset classes that incorporates their broad liquidity profile.

Exhibit 10 Major Asset Class Categories

	Equity & Equity-Like	Fixed Income & Fixed Income-Like	Real Estate
Marketable/Liquid	Public Equity Long/Short Equity Hedge Funds	Fixed Income Cash	Public Real Estate Commodities
Private/Illiquid	Private Equity	Private Credit	Private Real Estate Private Real Assets

4.1.2 An Approach Based on Expected Performance under Distinct Macroeconomic Regimes

Investors may also categorize asset classes based on how they are expected to behave under different macroeconomic environments, and investors may assign roles to them in a broad macroeconomic context:

- *Capital growth assets* would be expected to benefit from healthy economic growth. Public and private equities would belong to this category.
- *Inflation-hedging assets*—so-called “real assets” such as real estate, commodities, and natural resources but also inflation-linked bonds—would be expected to outperform other asset classes when inflation expectations rise or actual inflation exceeds expectations.
- *Deflation-hedging assets* (e.g., nominal government bonds) would be expected to outperform most of the other asset classes when the economy slows and inflation becomes very low or negative.

In Exhibit 11, we illustrate how investors may think about the expected performance of various asset classes in a broad macroeconomic context. Each asset class is positioned along the continuum to illustrate the macroeconomic environment in which we would expect it to generate strong performance. Such mapping is usually based on both historical experience and qualitative judgment. Considering the fundamental economic drivers of asset classes could help investors construct portfolios that are better diversified and more robust under various economic conditions and scenarios.

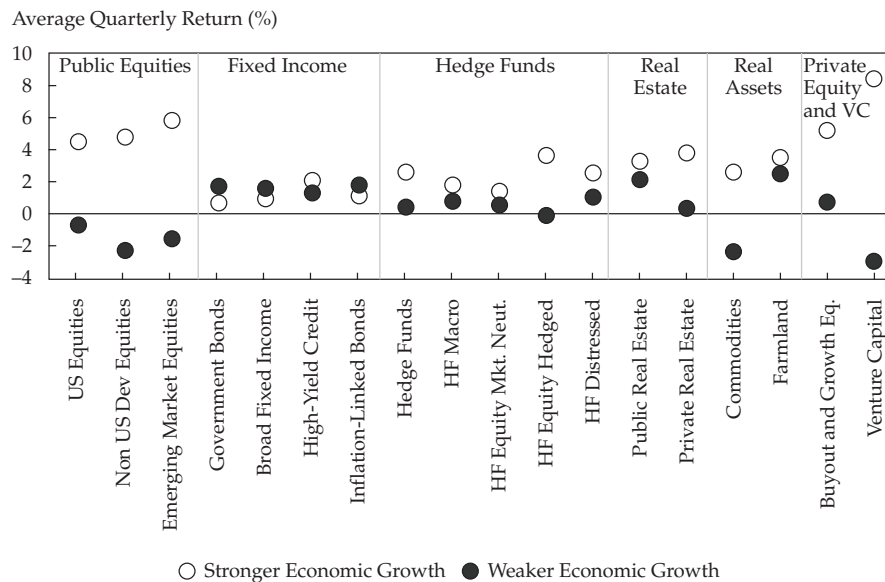
Exhibit 11 Asset Classes Grouped by the Macroeconomic Environment under Which They Would Be Expected to Generate Strong Performance

		Inflation Environment		
		Deflation	Moderate Inflation	High Inflation
Economic Environment	High Growth		Public Equity Private Equity High-Yield Bonds Private Credit	Real Estate Commodities
	Low Growth/ Recession	Government Bonds		Inflation-Linked Bonds Gold

Source: Authors' data.

Exhibit 12 illustrates the average quarterly total return of various asset classes and alternative strategies under stronger and weaker economic growth environments between 1997 and 2017, a period of low to moderate inflation in developed markets.

Exhibit 12 Historical Asset Class Performance under Stronger and Weaker Economic Growth Periods (1997–2017)



Notes: Strong and weak economic periods were determined using quarterly GDP data. Strong growth periods were those quarters when GDP growth exceeded the average GDP growth through the full historical sample.

Sources: The exhibit is based on the authors' calculations. Index data is based on the following. US Equities: Russell 3000; Non-US Developed Market Equities: MSCI EAFE USD Net unhedged; Emerging Market Equities: MSCI Emerging Markets Net USD unhedged; Governments: Bloomberg Barclays US Treasury Index; Broad Fixed Income: Bloomberg Barclays US Aggregate; High Yield: Bloomberg Barclays US Corporate High Yield; Inflation-Linked Bonds: Bloomberg Barclays US Government Inflation-Linked Bonds Index; Hedge Funds: HFRI; Public Real Estate: Dow Jones Equity REIT Index; Private Real Estate: NCREIF Property Index; Commodities: S&P GSCI Total Return Index; Farmland: NCREIF Farmland Index; Buyout and Growth Equities: Cambridge Associates US Private Equity Index; Venture Capital: Cambridge Associates US Venture Capital Index.

Public and private equities, hedge funds, and commodities posted strong returns amid strong economic growth conditions and weaker returns amid weaker economic conditions. Commodities exhibit a bigger disparity between returns in periods of stronger and weaker growth than does the hedge fund category.

Within fixed income, government bonds posted higher returns during periods of weaker economic growth—when investors likely reallocated from risky assets to safer assets. On the other hand, high-yield bonds (and potentially private credit, if we assume a behavior pattern similar to that of high-yield bonds) performed well during periods of stronger economic growth but posted lower returns during weaker economic periods, likely because of concerns about weakening credit quality.

Understanding how various asset classes behave under distinct macroeconomic regimes enables investors to tailor the asset allocation to align with their fundamental goals or to mitigate their fundamental risks. If the investment portfolio has a specific goal, such as hedging inflation risk, then it would be logical to build a portfolio that is dominated by asset classes that are expected to perform best amid rising inflation. Even if the portfolio's goal is to generate high return over the long run, combining

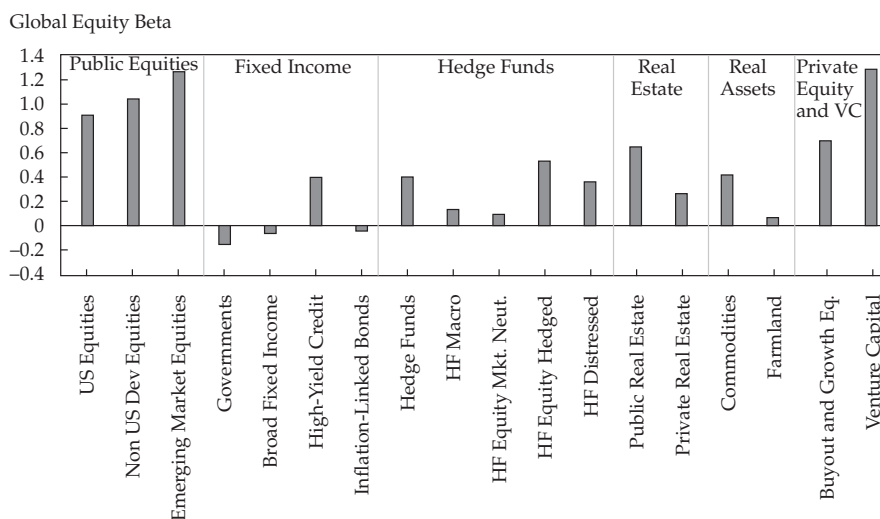
“growth” asset classes with “inflation-hedging” or “deflation-hedging” asset classes could make the asset allocation more resilient to changing economic and market conditions. This approach can be extended to macroeconomic scenario analysis and stress testing when the analyst evaluates how various asset allocation options would perform under conditions of high or low economic growth and/or inflation, and it can identify which economic conditions would hurt the investment portfolio the most.

4.2 Risk-Based Approaches to Asset Classification

When we assign traditional and alternative asset classes to certain functional roles in the portfolio, or when we assess how different asset classes would perform under distinct macroeconomic regimes, we can also easily realize that many traditional and alternative asset classes share similar characteristics that can result in high correlations. We may put public equities in the same functional bucket as private equity, and we may expect elevated default rates from high-yield bonds and private credit during recessionary environments.

Exhibit 13 compares the betas of various traditional and alternative asset classes to global equities. The chart clearly shows that private equity and venture capital asset classes have global equity betas similar to public equities. On the other hand, betas of various hedge fund strategies differ significantly. Hedge fund returns, in aggregate, had a beta of 0.4. However, global macro or equity market-neutral strategies had betas as low as 0.1. The long/short “equity hedged” strategy’s beta is estimated to be much higher, around 0.5, which is consistent with its long equity bias.

Exhibit 13 Global Equity Beta of Various Asset Classes, 1997–2017



Note: Betas were estimated as a regression slope of representative index returns relative to the global equity return stream over the time period 1997–2017.

Sources: Authors’ calculations; index data sources are the same as those in Exhibit 12.

Many investors have begun to view asset allocation through a risk factor lens to capture these similarities. In this section, we extend the risk factor asset allocation framework introduced in earlier readings to alternative investments using the following risk factors:

- *Equity market return*: representative of the general direction of global equity markets, and investors may also refer to this as the best market proxy for “growth.”
- *Size*: excess return of small-cap equities over large-cap equities.
- *Value*: excess return of value versus growth stocks (*negative* factor sensitivity = *growth* bias).
- *Liquidity*: the Pastor–Stambaugh liquidity factor⁵—a market-wide liquidity measure based on the excess returns of stocks with large sensitivity to changes in aggregate liquidity (less-liquid stocks) versus stocks with less sensitivity to changing liquidity (more-liquid stocks).
- *Duration*: sensitivity to 10-year government yield changes.
- *Inflation*: sensitivity to 10-year breakeven inflation changes obtained from the inflation-linked bond markets.
- *Credit spread*: sensitivity to changes in high-yield spread.
- *Currency*: sensitivity to changes in the domestic currency versus a basket of foreign currencies.

This framework can easily be extended further to other risk factors, like momentum or volatility.

Exhibit 14 illustrates risk factor sensitivities of various traditional and alternative investment strategies using a construct as discussed by Naik, Devarajan, Nowobilski, Page, and Pedersen (2016). The parameters in the table are regression coefficients based on 20 years of historical data. Quarterly index returns representing each asset class were regressed on the risk factors listed previously. Note that for conventional reasons we changed the signs of the “nominal duration” and “credit spread” sensitivities: The 4.2 duration of broad fixed income, for example, means that this asset class would experience an approximate 4.2% decline in response to a 100 bps increase in the nominal interest rates.

Exhibit 14 Factor Sensitivity Estimates across Various Asset Classes

Asset Classes	Equity	Size	Value	Liquidity	Nominal Duration	Inflation	Credit Spread	Currency	R-squared
US Equities	1.0								1.00
Non-US Dev Equities	0.9							0.7	0.86
Emerging Mkt Equities	1.1	0.5						0.5	0.66
Government Bonds					4.8				0.96
Broad Fixed Income					4.2		0.6		0.89
High-Yield Credit					4.1		4.2		0.95
Inflation-Linked Bonds					6.6	7.0			0.82

5 For more details on Pastor–Stambaugh liquidity factors, see Naik et al. (2016).

Exhibit 14 (Continued)

Asset Classes	Equity	Size	Value	Liquidity	Nominal Duration	Inflation	Credit Spread	Currency	R-squared
Hedge Funds	0.3	0.1					0.6		0.74
HF Macro	0.2	0.2			1.9	3.1	−0.9	0.1	0.28
HF Equity Mkt. Neut.	0.1								0.14
HF Equity Hedged	0.5								0.72
HF Distressed	0.1	0.2					1.8		0.72
Commodities						18.0		0.8	0.36
Public Real Estate	0.9				4.6	0.9			0.38
Private Real Estate	0.2			0.1		2.4			0.20
Buyout & Growth Equities	0.6	0.2	−0.3	0.1					0.70
Venture Capital	0.8	0.6	−1.8	0.2					0.38

Note: Only statistically significant slopes are displayed in the exhibit. Sources are the same as those for Exhibit 12.

In a risk factor-based asset allocation framework, the factors represent the systematic risks embedded in the selected asset classes and investment strategies. The primary systematic risk factors would fully, or almost fully, explain the behavior of broad, passive traditional public asset classes. There should be a relatively larger portion of unexplained risk in the alternative asset classes. This arises from such issues as the appraisal-based valuation in real estate, the idiosyncratic risks in the portfolio companies of private equity funds, or the idiosyncratic risks in hedge funds resulting from active management. (This last one is logically intuitive if you subscribe to the belief that returns generated by hedge fund strategies should be primarily driven by *alpha* rather than systematic risk factors.)

The extension of the risk factor framework to alternative asset classes allows every asset class to be described using the same framework. Investors can therefore more clearly understand their sources of investment risk and identify the intended and unintended tilts and biases they have in the portfolio. Furthermore, a risk factor framework enables investors to more efficiently allocate capital and risk in a multi-dimensional framework (i.e., a framework that seeks to do more than simply achieve the highest return at a given level of volatility). If an investor, for example, would like to increase the portfolio's inflation risk-mitigating exposure, decomposing this specific risk factor from inflation-linked bonds, real estate, or commodity asset classes could help the investor to identify the asset classes and exposures that are most likely to facilitate that goal.

Risk factor-based approaches improve upon the traditional approaches in identifying the investment opportunity set but do have certain limitations. As mentioned earlier, a small set of systematic risk factors is insufficient to describe the historical return stream of alternative asset classes. Note that all non-zero-risk factor coefficients displayed in the table are statistically significant based on their *t*-statistics. Although our eight illustrative factors fit the total return history of traditional asset classes with *r*-squared statistics of 0.8–1.0, the *r*-squared ratios for alternative investments are lower, ranging between 0.3 and 0.7. Increasing the number of risk factors would certainly improve the goodness of fit, but too many factors could make the risk factor-based asset allocation framework difficult to handle and interpret. In addition, certain risk factor sensitivities can be quite volatile, making a “point in time” factor-based definition

of an asset class a poor descriptor of the class's expected behavior. For example, the aggregate hedge fund inflation beta typically fluctuates in the range of 0.3 to 0.4, while the inflation beta of commodities fluctuates much more widely.⁶

EXAMPLE 2

Applying Risk Factors for Inflation Hedging

- 1 The CIO (chief investment officer) of the United Retired Workers Plan would like to reduce inflation risk in the portfolio. Based on the data displayed in Exhibit 14, which asset classes would you recommend as potential inflation-hedging tools?
- 2 The CIO is not only concerned about inflation but also rising interest rates. Which alternative asset classes would you recommend for consideration?

Solution to 1:

Commodities and inflation-linked bonds have the highest factor sensitivity to inflation, so they are the most obvious candidates. Real estate (both public and private) also has some potential to protect against inflation. Based on the data presented, macro hedge fund strategies also exhibited a positive inflation beta, but given their active nature, further analysis may be needed before choosing them as inflation-hedging vehicles.

Solution to 2:

Commodities and private real estate would be the likely asset classes to hedge against rising interest rates, given their zero-factor sensitivity to nominal duration. Some of the hedge fund strategies also show zero-factor sensitivity to duration, but the relationship may not hold true in the future given the actively managed nature of hedge funds. Although Exhibit 14 indicates equity strategies (both public and private) also show little to no sensitivity to rising interest rates (duration) bonds and equities have been more highly correlated in the past.

4.2.1 Illustration: Asset Allocation and Risk-Based Approaches

Let's look at an example of how a risk-based approach may enhance traditional asset allocation. In Exhibit 15, we show two investment portfolios, Portfolio A and Portfolio B, that have exactly the same high-level asset allocations. However, the underlying investments in the two portfolios are quite different. The fixed-income assets in Portfolio A are government bonds, while the fixed-income assets in Portfolio B are high-yield bonds. Hedge fund investments in Portfolio A are represented by very low equity beta market neutral strategies, while Portfolio B is invested in the higher beta long/short equity hedge funds. Similarly, Portfolio B's investments in real assets and private equity have higher risk than those in Portfolio A.

⁶ For further detail on expanding asset allocation to risk allocation, we refer to Naik et al. (2016) and Cambridge Associates LLC (2013).

Exhibit 15 Traditional Asset Allocation and Risk Contribution Comparison

Broad Asset Classes	Asset Allocation		Underlying Investments		% Contribution to Risk	
	Portfolio A	Portfolio B	Portfolio A	Portfolio B	Portfolio A	Portfolio B
Fixed Income	20%	20%	Government Bonds	High-Yield Bonds	-6.5%	7.6%
Public Equities	20%	20%	US Equities	Non-US Developed Equities	51.4%	18.2%
Hedge Funds	20%	20%	Equity Market Neutral	Long/Short Equity	5.4%	11.1%
Real Assets	20%	20%	Inflation-linked bonds	REITs	0.7%	13.2%
Private Equity	20%	20%	Buyout	Venture Capital	48.9%	49.8%
Total	100%	100%				
				Expected Return	5.3%	8.8%
				Volatility	5.9%	16.5%
				Equity Beta	0.30	0.79

Notes: The percentage contribution to risk is a result of three components: the asset allocation to a specific asset, its volatility, and its correlation with the other assets. For fixed income, the contribution to total risk is negative in the case of Portfolio A because government bonds have negative correlations with other asset classes; however, it is positive in the case of Portfolio B because high-yield bonds have positive correlations with the other asset classes.

Source: Authors' calculations.

As a result of these major differences between nominally similar broad asset allocations, it is not surprising that Portfolio B has higher volatility, beta, and expected return compared to Portfolio A. Let's look more closely at the risk contribution of each of the asset classes:

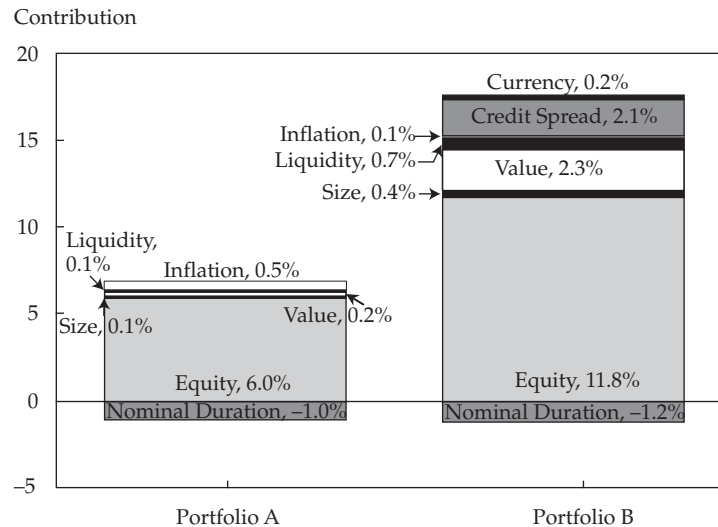
Portfolio A. The majority of the risk in Portfolio A comes from public and private equity. Hedge funds contribute approximately 5% to the total risk, and fixed income actually reduces risk because government bonds had negative correlations with public equities in our historical data sample.

Portfolio B. Private equity explains about half of the total portfolio risk of Portfolio B. (In this portfolio, the private equity allocation is represented by the higher risk venture capital.) Public equities, hedge funds, and real assets each contribute roughly the same to the total risk of the portfolio. This is consistent with the equity-like characteristics of the underlying assets in the portfolio. The long/short equity hedged strategy has an equity beta of around 0.5, and REITs have an equity beta of 0.9. In Portfolio B, fixed income contributes positively to total risk, consistent with high-yield bonds' positive correlation with equities over the time series.

Although the nominal asset allocations of the two portfolios are the same, the risk profile and the risk allocation among asset classes are significantly different. Let's go one step further and apply the risk factor sensitivities of Exhibit 14 to our hypothetical portfolios. Exhibit 16 shows the absolute contribution to total portfolio risk by risk factor. This approach moves beyond the borders of asset classes and aggregates the equity risk factor embedded in public equities, private equities, venture capital, and REITs into a single-factor contribution. Both portfolios are highly dominated by exposure to equity risk. Portfolio A's total risk is almost fully explained by the exposure

to the equity factor, while about 70% of Portfolio B's total risk comes from the equity risk factor alone. Portfolio B also has exposure to the size and value factors, driven by the allocation to venture capital. Finally, we can also see that although Portfolio B is not directly investing in government bonds, some risk mitigation benefit still arises from the low "duration" component of high-yield bonds and REITs.

Exhibit 16 Absolute Contribution to Total Risk by Risk Factors



This is an extreme example (the two portfolios have vastly different expected returns), but it is useful to illustrate how factor sensitivities can be used to explore the underlying risk exposures in seemingly similar asset allocations.

4.3 Comparing Risk-Based and Traditional Approaches

Investors often employ multiple approaches in setting their asset allocation for a portfolio that includes alternative investments. When applying these various approaches, investors must consider their strengths and limitations.

Main strengths of traditional approaches:

- *Easy to communicate.* Listing the roles of various asset classes is intuitive and easy to explain to the decision makers, who often have familiarity with the traditional asset class-based approach. Scenario analyses based on historical or expected behavior of various asset classes under different macroeconomic conditions can help to introduce quantitative aspects of the portfolio's expected performance and risk and substantiate the asset allocation proposal.
- *Relevance for liquidity management and operational considerations.* Public and private asset class mandates have vastly distinct liquidity profiles. Thus, although private and public equity would have a lot of commonality in their risk factor exposures, they would be positioned very differently from a liquidity management perspective. Similarly, investors must implement the target asset allocation by allocating to investment managers. The traditional categorization of asset classes may be necessary to identify the relevant mandates—what portion of the equity portfolio she would like to allocate to equity-oriented hedge funds rather than to long-only equity managers.

Main limitations of traditional approaches:

- *Over-estimation of portfolio diversification.* Without a proper analytical framework for assessing risk, investors may have a false sense of diversification. An allocation spread across a large number of different asset classes may appear to be very well diversified, when, in fact, the underlying investments may be subject to the same underlying risks.
- *Obscured primary drivers of risk.* Investments with very different risk characteristics may be commingled under the same asset class category. For example, government bonds and high-yield bonds may both be classified as “fixed income,” but each has distinct risk characteristics.

Risk-based approaches are designed to overcome some of these limitations.

Key benefits of risk-based approaches:

- *Common risk factor identification.* Investors are able to identify common risk factors across all investments, whether public or private, passive or active.
- *Integrated risk framework.* Investors are able to build an integrated risk management framework, leading to more reliable portfolio-level risk quantification.

Key limitations of risk-based approaches:

- *Sensitivity to the historical look-back period.* Empirical risk factor exposure estimations may be sensitive to the historical sample. For example, the duration of a bond portfolio or the beta of a diversified equity portfolio could be reasonably stable, but the estimated inflation sensitivity of real assets can change rapidly over time. Thus, the analyst has to be cautious when interpreting some of the risk factor sensitivities, such as the “inflation beta” of commodities.
- *Implementation hurdles.* Establishing a strategic target to different risk factors is a very important high-level decision, but converting these risk factor targets to actual investment mandates requires additional considerations, including liquidity planning, time and effort for manager selection, and rebalancing policy.

INVESTMENT CONSIDERATIONS RELEVANT TO THE DECISION TO INVEST IN ALTERNATIVES

5

In addition to the risk, return, and correlation characteristics relevant to the decision to invest in the alternative asset classes, many operational and practical complexities must be considered before finalizing a decision to invest. It is essential that the investor be fully aware of these complexities: Failure to grasp these differences between traditional and alternative investments can derail an investment program. The primary factors to consider include:

- properly defining risk characteristics;
- establishing return expectations;
- selection of the appropriate investment vehicle;
- operational liquidity issues;
- expense and fee considerations;

- tax considerations (applicable for taxable entities); and
- build vs. buy.

5.1 Risk Considerations

Mean–variance optimization (MVO), widely used in modeling asset allocation choices, cannot easily accommodate the characteristics of most alternative investments. MVO characterizes an asset’s risk using standard deviation. Standard deviation is a one-dimensional view of risk and an especially poor representation of the risk characteristics of alternative investments—where assets suffer some degree of illiquidity, valuations may be subjective, and returns may be “chunky” and not normally distributed. The non-standard deviation risks are usually accommodated in an MVO framework by assigning a higher standard deviation than might be derived solely by looking at the historical returns of the asset class.

Most approaches to asset allocation assume that the portfolio’s allocation to an asset class is always fully invested. Although this is not an assumption that is limited to alternatives, the problem is exaggerated with the private alternative strategies where it could take several years for capital to be invested and where capital is returned to the investor as investments are sold. Thus, it is rare that the *actual* asset allocation of a program with a significant exposure to alternatives will mirror the *modeled* asset allocation. This suggests that the investor must carefully (and continually) monitor the program’s aggregate exposures to ensure that the risks are in line with the strategic asset allocation. A case in point: Some investors over-allocated to private equity, real-estate, and other call-down funds prior to 2008 in order to more quickly reach their asset allocation targets. Many of these investors then found themselves in a situation where they were receiving capital calls for these commitments during 2008 and 2009, a period where their public assets had lost considerable value and liquidity and cash were scarce. Some investors had to reduce distributions, sell illiquid investments in the secondary market at severely discounted prices, and/or walk away from their fund commitments, thereby forfeiting earlier investments.

Although every strategy (and, by extension, each individual fund) will have its own unique risk profile, we provide two examples of the complications that might be encountered when modelling an allocation to alternative investments.

Short-only strategy: A short-biased fund can provide strong diversification benefits, lowering a portfolio’s aggregate exposure to the equity risk factor; however, a short-only fund has a risk profile quite unlike a long-only equity fund. Most investors understand that a long-only equity fund has theoretically infinite upside potential and a downside loss bounded by zero (assuming no leverage). A short-biased or short-only fund has the opposite distribution. A short-selling strategy is capped on its upside but has unlimited downside risk.

Option payouts: Some hedge fund strategies will structure their trades as call options either by owning call options outright or by synthetically replicating a call option (e.g., convertible bond arbitrage in which the manager goes long the convertible bond, short the equity for the same underlying, and hedges the interest rate risk). If executed properly, the fund would have limited downside but unlimited upside. It is difficult, if not impossible, to accurately model such a return profile by looking simply at a fund’s historical standard deviation or other risk metrics, especially if the fund’s track record does not encompass a full market cycle.

5.2 Return Expectations

Given the limited return history of alternative investments (relative to stocks and bonds) and the idiosyncratic nature of alternative investment returns, no single accepted approach to developing the return expectations required in an asset allocation exercise exists. One approach that can be applied with some consistency across asset classes is a “building blocks” approach: Begin with the risk-free rate, estimate the return associated with the factor exposures relevant to the asset class (e.g., credit spreads, level and shape of the yield curve, equity, leverage, liquidity), apply an assumption for manager alpha, and deduct appropriate fees (management and incentive) and taxes. Where the portfolio already contains an allocation to alternative investments, the underlying money managers can be helpful in estimating exposures and return potential. The portfolio’s current positions can be characterized by their known exposures, rather than through a generic set of exposures that may not be truly representative of the program’s objectives for the asset class exposure. Say, for example, that the investor’s hedge fund program deliberately excludes long/short equity hedge funds because the investor chooses to take equity risk in the long-only portion of the portfolio. The return (and risk) characteristics of this hedge fund allocation would be very different from those of a broad-based allocation to hedge funds, which typically has a significant weight to long/short equity funds.

5.3 Investment Vehicle

Most alternative investments are implemented through a private (limited) partnership that is controlled by a general partner (GP), the organization and individuals that manage the investments. The asset owner becomes a limited partner (LP) in the private partnership. The main rationale for using the limited partnership format is that it limits the investor’s liability to the amount of capital that she has contributed; she is not responsible for the actions of or the debts incurred by the GP. The investor may invest directly into a manager’s fund or through a fund of funds, a private partnership that invests in multiple underlying partnerships. Larger investors may also consider making co-investments alongside a manager into a portfolio company, or they may make direct private equity investments on their own.

Private limited partnerships are the dominant investment vehicle for most alternative investments in private equity, real estate, private credit, and real assets. In the United States, hedge funds will tend to employ two structures: a limited partnership (typically Delaware-based) or an offshore corporation or feeder fund (possibly based in the Cayman Islands, Bermuda, or the British Virgin Islands) that usually feeds into an underlying limited partnership (i.e., feeder fund). European hedge funds tend to register their vehicles in Ireland or Luxembourg⁷ as a public limited company, a partnership limited by shares, or a special limited partnership.

There are growing opportunities to invest in alternatives using mutual funds, undertakings for collective investment in transferable securities (UCITS), and/or separately managed accounts (SMAs), although the strategies implemented through these more-liquid vehicles are unlikely to have the same risk/return profile as their less-liquid counterparts. The requirements and demands of a broader investor base have made mutual funds, UCITS, and SMAs increasingly popular. We describe the structure, benefits, and drawbacks of each of these vehicles.

Direct investment in a limited partnership: An investor with the necessary scale and expertise can purchase limited partnership interests directly from the GP. GPs have broad discretion to select and manage the underlying investments and will typically

⁷ See Eurekahedge, “2016 Key Trends in Global Hedge Funds” (August 2016).

invest a portion of their capital in the fund alongside the limited partners. Because each limited partnership follows its own distinct investment strategy, the investor must often invest in multiple partnerships to diversify idiosyncratic risk. In order to maintain the limited liability shield afforded by the limited partnership structure, the investor must not become too involved in the operation of the fund itself.

Funds of funds (FOFs): Many investors lack the necessary scale and investment/operational expertise to access, evaluate, and develop a diversified alternative investment program. An FOF pools the capital of these investors, allowing them to achieve an allocation to an asset class that would otherwise be unobtainable. An FOF manager will typically specialize in a certain alternative strategy, such as Asian private equity funds, and may invest in either many or just a handful of underlying funds. The FOF manager is responsible for sourcing, conducting due diligence on, and monitoring the underlying managers. Using an FOF simplifies the investor's accounting and reporting: Capital calls from the underlying funds are frequently consolidated into a single capital call by the FOF, and investors receive a single report consolidating the accounting and investment results of all the underlying funds. The FOF manager does charge additional fees for these services. Investors in an FOF also lose a degree of flexibility to customize their exposures.

SMAs/funds of one: As large institutions and family offices increased capital allocated to the alternative investment space, many of them demanded more-favorable investment terms and conditions than those offered to smaller investors. Some alternative investment managers, interested in accessing these large pools of capital, have agreed to offer investment management services to these clients through a highly customizable SMA. SMAs have very high minimum investments and pose greater operational challenges for both the manager and the investor. In instances where an SMA is impractical, fund managers have created a "fund of one"—a limited partnership with a single client. These funds have many of the same benefits as an SMA but can be easier to implement. (For example, an SMA requires that the *investor* must be approved by each of the counterparties to any derivatives contracts. In a fund of one, GPs must obtain and maintain these approvals, which is something that they do in the ordinary course of running their investment businesses.)

SMAs and funds of one cannot generally avail themselves of the alignment of interests that arises from the investment of GP capital alongside that of the LPs. When other clients are invested in the GP's primary investment vehicles at the GP's standard fees and to which the GP has committed some of its own capital, there is a risk that the GP favors these other funds in allocating capital-constrained investment opportunities.

Mutual funds/UCITS/publicly traded funds: A number of open-ended mutual funds and UCITS seek to replicate some alternative investment strategies, particularly hedge funds. Nominally, these allow smaller investors to access asset classes that would otherwise be unavailable to them. It should be noted, however, that these vehicles often operate with regulatory restrictions that limit the fund manager's ability to implement the investment strategy offered via their primary investment vehicle. Accordingly, the investor must be cautious in considering whether the track record achieved in the manager's primary investment vehicle is representative of what might be achieved in a mutual fund, UCIT, or other publicly-traded vehicle. For example, a mutual fund that offers daily liquidity is unlikely to be a suitable investment vehicle for a distressed or activist investment fund, where the time horizon to realize investment returns may be one to two years. This "liquid-alt" space grew significantly following the Global Financial Crisis.

5.4 Liquidity

Traditional assets are generally highly liquid, and the vehicles that are typically used by investors to access the asset class (e.g., separate accounts or daily valued commingled funds, such as mutual funds and UCITS) typically do not impose additional liquidity constraints. That is not the case with many alternative assets, where both the vehicle and the underlying instruments may expose the investor to some degree of liquidity risk. We address liquidity risks at the fund and security level separately.

5.4.1 Liquidity Risks Associated with the Investment Vehicle

The most common vehicle employed by alternative asset managers is the private limited partnership previously described. (Some investors will invest via an offshore corporate structure used for certain tax and regulatory reasons. This offshore corporation is typically a “feeder” fund—a vehicle that channels investors’ assets to the master limited partnership.) The private placement memorandum (PPM) details the subscription and redemption features of the partnership. Liquidity provisions differ across asset classes but are substantially similar within asset classes. Exhibit 17 details the typical liquidity considerations associated with investing in a private limited partnership. SMA liquidity provisions may be negotiated directly with the manager.

Exhibit 17 Typical Liquidity Provisions for Alternative Investment Vehicles

	Subscription	Redemption	Lock-Up
Hedge Funds	<ul style="list-style-type: none"> Typically accept capital on a monthly or quarterly basis. 	<ul style="list-style-type: none"> Quarterly or annual redemptions with 30 to 90 days’ notice required. May be subject to a gate limiting the amount of fund or investor assets that can be redeemed at any one redemption date. 10% holdback of the redemption amount pending completion of the annual audit. 	<ul style="list-style-type: none"> Typically one year in the US; shorter in Europe. Redemptions prior to the lock-up period may be permitted but are subject to a penalty, typically 10%.
Private Equity, Private Credit, Real Estate, and Real Asset Funds	<ul style="list-style-type: none"> Funds typically have multiple “closes.” The final close for new investors is usually one year after the first close. Committed capital is called for investment in stages over a 3-year investment period. 	<ul style="list-style-type: none"> No redemption provisions. Fund interests may be sold on the secondary market, subject to GP approval. Distributions paid as investments are realized over the life of the fund. Unrealized assets may be distributed in kind to the LP at fund termination. 	<ul style="list-style-type: none"> Typical 10-year life, with GP option to extend fund term 1 to 2 years.

Secondary markets: Although fund terms may prevent investors from redeeming early, a small but growing secondary market for many alternative funds exists. Some brokers will match sellers and buyers of limited partnership interests, and some secondary funds’ main objective is to buy limited partnership interests from the original investor. These transactions typically occur at a significant discount to the net asset value (NAV) of the fund and usually require the GP to approve the transaction.

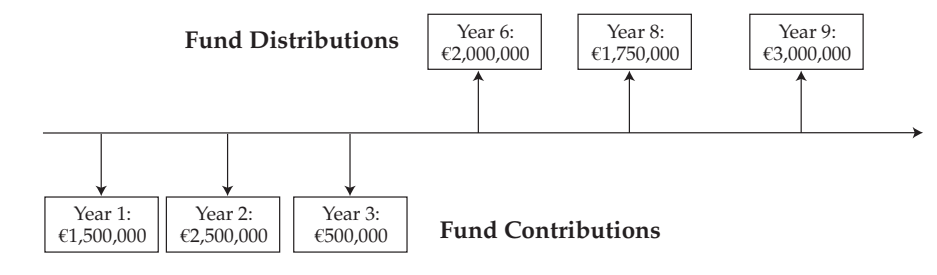
Understanding a drawdown structure: Private equity/credit, private real estate, and real asset funds typically call investors' capital in stages as fund investments are identified. This investment period is specified in the PPM and typically ranges from three to five years from the initial capital call. Thus, although an investor may have committed a specified percentage of the portfolio to an asset class, the allocation may not be fully funded until some point well into the future. We will illustrate the drawdown structure for a single fund using a hypothetical commitment to a real estate fund:

The Chan Family Partnership commits €5,000,000 to Uptown Real Estate LP. The fund has a three-year investment period. When fully invested, Uptown expects to hold 12 to 15 properties. The capital call schedule for Uptown may look something like this:

- Year 1: €1,500,000 of the €5,000,000 committed is called, covering three investments
- Year 2: €2,500,000 is called, covering six investments
- Year 3: €500,000 is called, covering two investments
- Year 6: €2,000,000 is distributed by Uptown Real Estate
- More distributions in subsequent years

Expanding on this example, Exhibit 18 shows how the cash flows for our hypothetical fund might operate throughout the fund's life.

Exhibit 18 Hypothetical Capital Call—Distribution Schedule



In reality, most funds will have several capital calls in a year. It is also possible that a fund may make a distribution before the final capital call occurs. Because of the highly uncertain liquidity profile of call down (or drawdown) funds (private equity/credit, real estate/real assets), it is incumbent on the investor to plan for multiple contingencies. Funds may end up calling significantly less capital than the investor assumed or may call capital at a faster pace than planned. Capital may be returned to the investor more quickly or more slowly than originally anticipated. Each of these scenarios could result in investors being under or over their target allocations. Critically, investors will want to verify that they have suitable liquidity, such that even under adverse conditions they are able to meet their capital calls. Investors who are unable to meet their capital calls may be required to forfeit their entire investment in the fund (or such other penalties as may be specified in the PPM).

The capital commitment/drawdown structure also presents potential opportunity costs for the investor. Returning to Exhibit 18, having committed €5,000,000 to Uptown Real Estate LP, the Chan Family Partnership is obligated to meet the GP's capital calls but must address the opportunity cost of having the committed capital invested in lower-returning liquid (cash) assets pending the capital call—or face the risk of having insufficient assets available to meet the capital call if the funds were invested in another asset class that has experienced a loss in the interim. Also note that only €4,500,000 of the €5,000,000 commitment was called before distributions began.

5.4.2 Liquidity Risks Associated with the Underlying Investments

The investor must be aware of any potential mismatch between the fund terms and the liquidity profile of the underlying instruments held by the fund. This is particularly important if the investor is negotiating fund terms or if other investors have terms that may be different from his own. Because the private market funds rarely offer interim liquidity, this problem most often arises in hedge funds. We provide a few examples of the issues an investor may encounter.

Equity-oriented hedge funds: The majority of assets in a typical equity-oriented hedge fund are liquid, marketable securities compatible with monthly or quarterly fund-level liquidity terms. Short positions may be notably less liquid than long positions, so funds that make greater use of short selling will have correspondingly lower overall liquidity. This should be taken into consideration when evaluating the potential for a liquidity mismatch between the fund's terms and the underlying holdings. Some otherwise liquid hedge fund strategies may own a portion of their holdings in illiquid or relatively illiquid securities. The GP may designate these securities as being held in a "side pocket." Such "side-pocketed" securities are not subject to the fund's general liquidity terms. The redeeming investor's pro rata share of the side pocket would remain in the fund and be distributed at such time as the fund manager liquidates these assets, which could take quarters or even years to accomplish. If the percentage of assets held in side pockets is large, this could render the fund's liquidity terms irrelevant. The investor must evaluate the illiquidity challenges inherent in the underlying holdings, including side pockets, in order to estimate a liquidity profile for the total portfolio.

Event-driven hedge funds: Event-driven strategies, by their nature, tend to have longer investment horizons. The underlying investments in a merger arbitrage strategy, for example, are generally liquid, but the nature of the strategy is such that returns are realized in "chunks." It is in the manager's and the investor's interests to ensure that the liquidity terms provide the necessary flexibility to execute the investment thesis. A hedge fund focused on distressed investing is dealing with both the "workout" horizon (the time frame over which the negotiations between the creditors and the company are being conducted) and the lesser liquidity of the distressed assets. The fund terms for a distressed strategy are likely to be much longer than other hedge fund strategies. (In fact, many distressed funds choose to organize in a private equity fund structure.)

Relative value hedge funds: Many relative value hedge funds will invest in various forms of credit, convertibles, derivatives, or equities that have limited or at least uncertain liquidity characteristics. Many funds will include provisions in the fund documents to restrict redemptions under certain scenarios so that they are not forced to sell illiquid securities at inopportune moments. Without such provisions, the fund manager may be forced to sell what securities they *can* (i.e., the more liquid holdings) rather than the securities that they *want*. This could have the unfortunate consequence of leaving remaining investors in the fund holding a sub-optimally illiquid portfolio. On the other hand, funds that deal in managed futures or similar instruments may have very flexible terms (daily or weekly liquidity, only a few days notification, etc.). This was a scenario many hedge fund managers faced during the Global Financial Crisis as investors made significant redemption requests to meet their own cash needs. The liquid funds were disproportionately affected as investors sought to raise cash wherever they could find it.

Leverage: A fund's use of leverage and its agreements with counterparties providing the leverage can also affect the alignment between fund terms and the investment strategy. If a strategy is levered, lenders have a first claim on the assets. The lenders' claims are superior to those of the LPs, and the lenders have preferential liquidity terms; most lenders can make a margin call on stocks, bonds, or derivatives positions with just two days' notice. Given that margin calls are most likely to happen when the markets (and/

or the fund) are stressed, the LPs' liquidity can evaporate as the most-liquid positions in the portfolio are sold to meet margin calls. The need to de-lever and sell assets to meet margin calls will typically result in a lower return when the market eventually recovers.

5.5 Fees and Expenses

In addition to management fees of 0.5% to 2.5% of assets and incentive fees of 10% to 20% of returns, investments in alternative assets often entail higher expenses passed through to or paid directly by the investor. These fees can result in a significant variation between the gross and net of fee returns. Consider a hedge fund that was earning a 3% gross quarterly return (12.6% annualized). After deducting a 2% management and a 20% incentive fee, accrued quarterly, the net return at year-end is just 8.2%.

Fees can have a larger impact on the difference between gross and net returns for such call-down-type fund structures as private equity funds, where the management fee is charged on *committed* capital, not invested capital. If the manager is slow to deploy capital, there can be a pronounced J-curve effect (negative IRRs in the early years) that can be difficult to overcome (the adage 'it takes a 100% return to recover from a 50% loss').

In addition, most alternative investment funds will pass through normal fund expenses, including legal, custodial, audit, administration, and accounting fees. For smaller funds, these additional costs can add up to another 0.5%. Larger funds can spread these same costs out over the larger asset base, and the pass-through to investors is likely to be in the range of 0.05% to 0.20% of assets. Some of these expenses have a limited life (e.g., the capitalized organizational expenses), so the impact can vary over time. Funds may also pass through to investors costs associated with acquiring an asset, including the due diligence costs and any brokerage commissions paid. A careful evaluation of the fund's offering documents is essential to understanding the all-in cost of an investment in alternatives.

5.6 Tax Considerations

For taxable investors, the tax implications associated with many alternatives can have a significant impact on their relative attractiveness. In many instances, a tax inefficient strategy, one that generates substantial short-term gains or taxable income, can significantly erode the anticipated return benefits. This arises frequently with many hedge fund strategies, especially those funds and fund companies where tax-exempt investors dominate the client base and the fund manager may be insensitive to tax efficiency. Vehicle selection becomes an important tool to mitigate potential tax consequences. For example, certain Asia-based investors may use European or other offshore vehicles that feed into US strategies in order to mitigate US tax withholding. Conversely, some funds benefit from preferential tax treatment that might add to its relative attractiveness.

Here are a few examples of these tax considerations:

- The US tax code has provisions that favor real estate, timber, and energy investments. Timber sales, for example, are taxed at lower capital gains rates rather than as ordinary income and may benefit from a depletion deduction. Commercial and residential building assets can be depreciated according to various schedules, with the depreciation offsetting income received on those assets. Some oil and natural gas royalty owners may benefit from a depletion deduction, offsetting income generated from the sale of the oil or gas.
- Some alternative investment strategies can generate unrelated business income tax (UBIT). UBIT arises when a US tax-exempt organization engages in activities that are not related to the tax-exempt purpose of that organization. Since

most tax-exempt entities seek to mitigate (if not avoid) taxes, they will want to verify whether such a fund might generate UBIT and, if so, whether the fund manager has an offshore vehicle that may shield the investor from such income.

- The taxable investor faces additional costs and operational hurdles because of the more complex tax filings. Some taxable investors must estimate their expected annual income, including income that is derived from investments. Deriving an accurate estimate can be a challenge. Unfortunately, if the misestimation is large enough it might result in tax penalties.

Tax considerations, like fees, will affect the return assumptions used in the asset allocation exercise.

5.7 Other Considerations

Although smaller investors seeking to build a diversified alternative investment program are generally constrained to use an intermediary, such as a fund of funds, large investors have the opportunity to build a program in-house and must decide whether this approach is appropriate given their governance structure. Key questions to explore in evaluating the options include the following:

- What is the likelihood that the investor can identify and gain access to the top-tier managers in the investment strategy?

Truly differentiated strategies and top-tier managers are notoriously capacity constrained, which tends to limit the amount of assets they can reasonably manage without negatively affecting investment returns. Fund managers who recognize this problem frequently limit the number of investors that they allow into their fund and may close their doors to new clients or capital. This can make it extremely difficult for investors to find and access top-tier managers. Investors who are subject to public disclosure requirements may be rejected by a manager who believes that success is based on a proprietary informational edge that could be eroded through these required public disclosures. Many studies on alternative assets have concluded that it may not be worth the costs and resources required to be successful in this space if investors do not have access to top-tier funds.

- What is the likelihood that the investor will be accorded the access needed to conduct effective due diligence on an investment strategy?

It is not enough to know when or if to invest with a fund manager; it is equally, if not more, important to be able to determine when to terminate the relationship. Having poor to no access to the key decision makers within the organization could make it difficult to ascertain if the conditions have changed such that a redemption is warranted. The situation could be even worse if other clients have good (or preferential) access to the fund manager, which might result in their redeeming early, leaving other, less-informed investors subject to gates or other more-restrictive redemption terms that could be triggered.

- What skills and resources does the investor have in-house to evaluate and monitor an alternative investment program?

This question is evaluated through a consideration of the cost tradeoffs, the investment expertise of in-house staff, the desire to tailor an investment program to investor-specific wants and needs, and the degree of control.

- Cost is typically the overriding factor in the decision to build a program in-house or buy an existing off-the-shelf product. The all-in costs of compensation, benefits, rent, technology, reporting, travel, overhead, and other miscellaneous expenses associated with managing an alternative investments

program can far exceed the costs associated with running a traditional asset portfolio. However, very large organizations may be able to justify the costs of building in-house teams.

- Investors seeking to leverage a manager's expertise through co-investments and other direct investment opportunities must build an in-house team with the expertise to evaluate specific securities and deals and must provide the infrastructure needed to support those efforts.
- Investors who require highly customized investment programs might be poorly served by consultants or FOFs who typically gain scale and margin by providing solutions that can be broadly applied to a large number of clients. For example, an endowment that wants their alternative investment program to consider environmental, social, and governance (ESG) factors (i.e., socially responsible investing) may have a difficult time finding an investment consultant who can deliver on the client's specific ESG requirements. Or, a family office that wants to emphasize tax-efficient angel investments might need to hire in-house resources in order to find and supervise these more specialized investments.
- Those investors who desire a high degree of control and/or influence over the implementation of the investment program are more likely to have this need met through an in-house program.

EXAMPLE 3

Considerations in Allocating to Alternative Investments

The investment committee (IC) for a small endowment has decided to invest in private equity for the first time and has agreed upon a 10% strategic target. The internal investment team comprises the CIO (chief investment officer) and two analysts. The IC asks the CIO to recommend an implementation plan at the next meeting.

- 1 What are the options the CIO should include in her report as it relates to vehicles, and what factors might influence the recommendation?
- 2 The IC provided no guidance as to expectations for when the investment program should reach its 10% target weight. What additional information should the CIO gather before presenting her plan of action?

Solution to 1:

The primary considerations for the CIO include the size of the private equity allocation, the team's expertise with private equity, and the available resources. Because this is a small endowment, it may be difficult to commit enough capital to achieve an adequate level of diversification. The size of the fund's investment team is also likely to be a concern. Unless there are financial resources to add a private equity specialist and/or employ an outside consultant, the fund-of-funds route would likely be the optimal vehicle(s) to implement a diversified private equity program.

Solution to 2:

The CIO should factor in the cash flows and anticipated liquidity profile of the overall endowment in considering the speed with which they would commit to a significant PE program. If, for example, the foundation is embarking on a capital campaign and anticipated distributions are small over the next few years, then commitments may be accelerated after factoring in an appropriate vintage

year diversification. (Because private investment returns are very sensitive to the fund's vintage year, it is common for investors to build up to a full allocation over a period of years, called vintage year diversification.) However, if the rest of the investment program is heavily exposed to illiquid investments (e.g., real estate, certain hedge fund strategies) and anticipated distributions to fund operating expenses are high, the CIO may want to commit at a slower pace.

EXAMPLE 4

Considerations in Allocating to Alternative Investments

A \$100 million client of a family office firm has requested that all public securities investments meet certain ESG criteria. The ESG ratings will be provided by an independent third-party firm that provides a rating for most public equities and some fixed-income issuers. Moreover, the family would like to dedicate a percentage of assets to support an "environmental sustainability" impact theme.

- 1 Which alternative investment strategies may not be suitable for this client given the ESG requirements?
- 2 What additional information might the family office firm require from the client in order to meet the environmental sustainability threshold?

Solution to 1:

Because the ESG criteria apply to all public securities, most hedge fund strategies would be precluded because they are typically owned in a commingled vehicle, such as a limited partnership or a mutual fund where transparency of holdings is limited and the investor has no influence over the composition of the underlying portfolio. Separate account strategies are available for certain large portfolios, but it is unlikely that a \$100 million client would be eligible for a custom portfolio that would be allocating only a small asset base to any particular fund.

Solution to 2:

The client and the manager would need to agree on a clear definition of environmental sustainability and the types of investments that might qualify for this theme. It is unlikely that most hedge funds, private credit, energy, or infrastructure strategies would be considered to positively impact environmental sustainability. The most likely candidates for consideration could be timber, sustainable farmland, and clean-tech funds under the venture capital category.

SUITABILITY CONSIDERATIONS

6

Alternative investments are not appropriate for all investors. We discuss briefly several *investor* characteristics that are important to a successful alternative investment program.

6.1 Investment Horizon

Investors with less than a 15-year investment horizon should generally avoid investments in private real estate, private real assets, and private equity funds. An alternative investment program in private markets may take 5 to 7 years to fully develop and another 10 to 12 years to unwind, assuming no new investments are made after the 7-year mark. Even a 10-year horizon may be too short to develop a robust private alternative investment program.

Other strategies can tolerate a shorter investment focus. Many hedge fund strategies that focus on public equities or managed futures have much shorter lock-ups (on the order of months or not at all). Some strategies can be entered and exited in shorter time frames, and the purchase or sale of limited partnership interests on the secondary market may be used to shorten the entry and exit phases of the process. However, the alternative investment program has a higher likelihood of success if the investor adopts a long-horizon approach coupled with an understanding of the underlying investment processes.

6.2 Expertise

A successful alternative investment program requires that the investor understand the risks entailed and the market environments that drive success or failure of each of the strategies. Understanding the breadth of the alternative investment opportunities and the complexity of strategies within each alternative class requires a relatively high level of investment expertise. Even if the investor is highly experienced, the risk of information asymmetry between the limited partner (LP) and the general partner (GP) is always there. A pension fund without full-time investment staff, or an individual without the resources to hire an adviser with a dedicated alternative investments team, is unlikely to have the investment expertise necessary to implement a successful alternative investment program.

Additionally, the investment philosophy of the asset owner (or its overseers) must be consistent with the principles of alternative investments. An investor whose investment philosophy is rooted in a belief that markets are fundamentally efficient may struggle to embrace an alternative investment program, where success is predicated on active management. A mismatch in philosophy could very well be a set up for failure when the alternative investments underperform traditional asset classes.

6.3 Governance

A robust investment governance framework ensures that an alternative investment program is structured to meet the needs of the investor. The following are hallmarks of a strong governance framework suitable to an alternative investment program:

- The long- and short-term objectives of the investment program are clearly articulated.
- Decision rights and responsibilities are allocated to those individuals with the knowledge, capacity, and time required to critically evaluate possible courses of action.
- A formal investment policy has been adopted to govern the day-to-day operations of the investment program.
- A reporting framework is in place to monitor the program's progress toward the agreed-on goals and objectives.

Investors without a strong governance program are less likely to develop a successful alternative investment program.

6.4 Transparency

Investors must be comfortable with less than 100% transparency into the underlying holdings of their alternative investment managers. In real estate, private equity, and real asset funds, the investor is typically buying into a “blind pool”—committing capital for investment in a portfolio of as-yet-unidentified assets. During the course of investment due diligence, the investor may have looked at the assets acquired in the manager’s previous funds, but there is no assurance that the new fund will look anything like the prior funds. Hedge fund managers are generally reluctant to disclose the full portfolio to investors on an ongoing basis. Even if you were to have access to the full underlying portfolio, it is rarely apparent where the true risk exposures lie without a detailed understanding of the investment themes the manager is pursuing.

Reporting for alternative funds is often less transparent than investors are accustomed to seeing on their stock and bond portfolios. Generally, no legal requirements mandate the frequency, timing, and details of fund reporting for private investment partnerships. For many illiquid strategies (real estate/assets, private equity/credit), reporting is often received well past month- or quarter-end deadlines that investors are accustomed to with their traditional investments.

A typical hedge fund report, usually available on a quarterly basis, may detail performance, top 10 holdings, and some general commentary on the capital markets as well as some factors that influenced fund performance. The hedge fund manager may also provide a risk report that broadly outlines the major risk exposures of the fund. There is no commonality among the risk reports provided from fund to fund. This hampers an investor’s efforts to develop a picture of aggregate risk exposure. Clients with separately managed accounts have access to portfolio holdings and may be able to produce their own risk reporting with a common set of risk metrics.

Private equity funds will provide more transparency into portfolio holdings, but the private equity fund report is unlikely to “slice-and-dice” the exposures by geography, sector, or industry. The investor must gather the additional information needed to develop a fuller exposure of the portfolio’s risk exposures and progress toward meeting expectations. Private equity managers typically provide an abbreviated quarterly report with a more detailed annual report following the completion of the fund’s annual audit.

This lack of transparency can shield questionable actions by GPs. In 2014, the US Securities and Exchange Commission found that more than 50% of private equity firms had collected or misallocated fees without proper disclosure to their clients.⁸ This study and subsequent lawsuits have increased transparency within the industry, although the industry remains opaque at many levels.

Reporting for private real estate funds commonly consists of a quarterly report with details on the fund’s size, progress in drawdowns, realizations to date, and valuations of unrealized investments as well as market commentary relevant to the fund’s strategy. Reports typically include details on each investment such as the original acquisition cost(s), square footage, borrowing details (e.g., cost of debt, leverage ratios, and debt maturity dates), and fundamental metrics regarding the health of the properties (e.g., occupancy rates and, if appropriate, the estimated credit health of tenants). Often there is qualitative commentary on the health of the property’s submarket, on anticipated next steps, and on the timing of realization(s). Reports are typically issued with a one-quarter lag to allow sufficient time to update property valuations. Annual reports, which frequently require updated third-party appraisals, may not be available until the second quarter following year end.

⁸ Andrew Ceresney, “Keynote Address: Private Equity Enforcement,” Securities Enforcement Forum West (12 May 2016).

Investors should ensure that funds use independent administrators to calculate the fund and LPs' NAV. These administrators are also responsible for processing cash flows, including contributions, fee payments, and distributions that are consistent with the fund documents. The use of independent administrators is common practice among hedge funds. It is relatively uncommon for a fund investing in illiquid strategies (e.g., private equity/credit, real estate/natural resources) to use an independent administrator. Funds that do not use third-party administrators have wide discretion in valuing assets. In the midst of the Great Financial Crisis, it was not uncommon for two different private equity firms with ownership interests in the same company to provide very different estimates of the company's value.

The lack of transparency common with many alternative investments can challenge risk management and performance evaluation. High-quality alternative investment managers will engage an independent and respected accounting firm to perform an annual audit of the fund; the audit report should be available to the LPs.

Regulatory requirements for mutual funds and UCITS funds require such standardized information as costs, expected risks, and performance data. Additional information may also be available on a periodic basis. Information provided to one investor should be available to all shareholders. These rules have been interpreted by some mutual fund/UCITS managers to mean that they cannot provide more-detailed, non-standardized information given the complexity of sharing it with a broad audience. This can possibly restrict the level of transparency certain shareholders can obtain for these vehicles.

EXAMPLE 5

Suitability Considerations in Allocating to Alternative Investments

The Christian family office is concerned with investor or manager fraud and so will invest only in separately managed accounts (SMAs).

- 1 What are the benefits and drawbacks to the use of SMAs?
- 2 The 75-year-old patriarch of the Christian family would like to consider a significant private equity allocation in a trust that he oversees on behalf of his youngest daughter. This would be the first alternative investment commitment made with any of the family's assets. The daughter is 40 years old. She will receive one-half of the assets outright upon his death. The remainder of the assets will be held in trust subject to the terms of the trust agreement. List some of the reasons why private equity may or may not be appropriate for this trust.

Solution to 1:

Although an SMA allows for greater transparency and control of capital flows (the manager does not generally have the authority to distribute capital from the client account), it has several potential disadvantages: 1) SMAs are not available or appropriate for many alternative strategies; thus, the requirement to invest via an SMA may limit the ability to develop an optimal alternative investment program. 2) A manager cannot invest alongside the client in the client's SMA. This may reduce the alignment of interest between the manager and the client and may give rise to conflicts of interest as trades are allocated between the SMA and the manager's other funds.

Solution to 2:

- Successful private equity investment requires a long time horizon. Given the patriarch's age, it is likely that half of the trust's assets will be distributed before the private equity program has had time to mature. This may lead to an unintended doubling in the size of the private equity allocation.
- The patriarch has no experience investing in alternative assets. Unless he is willing to commit the time, money, and effort and engage an outside adviser with the relevant expertise and access to top-tier funds, the likelihood of a successful private equity investment program would be low.
- Because the beneficiary of the trust is relatively young, the time horizon of the investment likely matches the profile of the underlying investor. It may be appropriate for the trust to invest in long-dated private equity assets, provided the investment is sized appropriately and the necessary expertise has been retained.

ASSET ALLOCATION APPROACHES

7

We mentioned earlier that one approach to determining the desired allocation to the alternative asset classes is to make the initial asset allocation decision using only the broad, liquid asset classes and do a second iteration of the asset allocation exercise incorporating alternative assets. After first addressing the challenges in developing risk and return assumptions for alternative asset classes, we then discuss three primary approaches that investors use to approach this second iteration.

- 1 *Monte Carlo simulation.* We discuss how Monte Carlo simulation may be used to generate return scenarios that relax the assumption of normally distributed returns. We illustrate how simulation can be applied to estimate the long-term risk profile and return potential of various asset allocation alternatives, and, in particular, we evaluate whether various asset allocation alternatives would satisfy the investor's ultimate investment objectives.
- 2 *Optimization techniques.* Mean–variance optimization (MVO) typically over-allocates to alternative asset classes, partly because risk is underestimated because of stale or infrequent pricing and the underlying assumption that returns are normally distributed. Practitioners usually address this bias towards alternatives by establishing limits on the allocations to alternatives. Optimization methods that incorporate downside risk (mean–CVaR optimization) or take into account skew may be used to enhance the asset allocation process.
- 3 *Risk factor-based approaches.* Risk factor-based approaches to alternative asset allocation can be applied to develop more robust asset allocation proposals.

These analytical techniques complement each other, and investors frequently rely on all of them rather than just using one or the other. Monte Carlo simulation can provide simulated non-normal (fat-tailed) data for a mean–CVaR optimization, but simulation can also be applied to analyze the long-term behavior of various asset allocation alternatives that are the results of portfolio optimization.

7.1 Statistical Properties and Challenges of Asset Returns

Alternative investments present the modeler with a number of analytical challenges. These two are particularly relevant in the asset allocation process:

- 1 Appraisal-based valuations used in private alternative investments often lead to stale and/or artificially smoothed returns. Volatility and other risk measures estimated based on these smoothed time series would potentially understate the actual, fundamental risk.
- 2 Although even the public asset classes can exhibit non-normal return distributions, skewness and fat tails (excess kurtosis) are more pronounced with many of the alternative investment strategies. Leverage, sensitivity to the disappearance of liquidity, and even the asymmetric nature of performance fees all contribute to additional skewness and excess kurtosis among alternative investments. This option–payoff style quality can undermine a simplistic statistical approach.

Asset allocators use various analytical approaches to mitigate the impact of these challenges.

7.1.1 Stale Pricing and Unsmoothing

Appraisal-based valuation is common in private real estate and private equity. The valuation parameter assumptions in the appraisal process change quite slowly. This has a smoothing effect on reported returns and gives the illusion that illiquid assets' performance is much less volatile than that of public marketable assets with similar fundamental characteristics. This issue also affects hedge funds in which the manager invests in illiquid or less-liquid assets whose valuations are updated infrequently or are using models with static valuation assumptions. These artificially smoothed returns can be detected by testing the return stream for serial correlation. If serial correlation is detected and found statistically significant, the analyst needs to unsmooth the returns to get a more accurate representation of the risk and return characteristics of the asset class we are modelling.

To illustrate unsmoothing, we use a simple approach described by Ang (2014). Exhibit 19 illustrates the reported quarterly return history of the Cambridge Associates Private Equity Index, as well as the unsmoothed series.⁹ The annualized volatility estimated using the reported quarterly return data and scaling using the square root of time convention is 9.5%.¹⁰ The widely accepted rule of scaling by the square root of time, however, is based on the assumption of serially uncorrelated, normally-distributed returns. In our example, the serial correlation of the quarterly reported private equity returns is 0.38, which, given the number of observations, is significant with a *t*-statistic of 4.09. Because our returns are serially correlated, we want to unsmooth the returns to get a better estimate of volatility. The volatility calculated on the unsmoothed return series is 14.0%, significantly higher than the volatility estimated from the unsmoothed data.

⁹ We used the following formula to unsmooth the report total return time series:

$$r_{t,\text{unsmoothed}} = (r_{t,\text{reported}} - s \times r_{t-1,\text{reported}}) / (1 - s),$$

where *s* denotes the estimated serial correlation of the time series.

¹⁰ To scale volatility estimates to a longer (or shorter) time horizon, the volatility can be multiplied by the square root of time. For example, if we know the quarterly volatility and want an annual volatility estimate, we would multiply the quarterly volatility estimate by the square root of 4. (This scaling convention assumes price changes are independent and returns are not serially correlated over time.)

Exhibit 19 C|A Private Equity Index Quarterly Returns

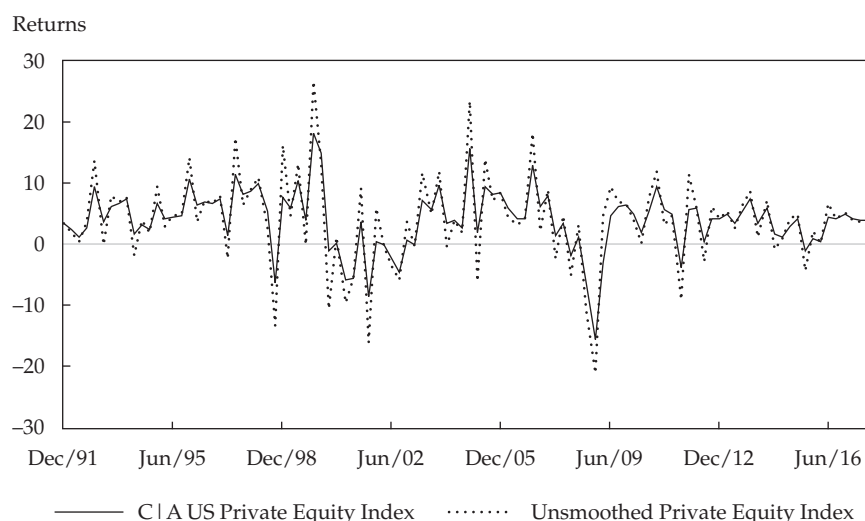


Exhibit 20 illustrates serial correlation and volatility estimates based on quarterly returns of a broad range of asset classes. Although the serial correlation of public marketable asset classes is generally low, private asset classes and some hedge fund strategies have higher serial correlations that indicate stronger smoothing effects. The higher the serial correlation in the reported return series, the larger the difference between the volatility based on the unsmoothed and reported (smoothed) return data. The impact of smoothing is the highest in the case of private investments, as suggested by the serial correlation for private real estate (0.85) and private equity (0.38). The unsmoothed volatility of private real estate is, in fact, three times the volatility that we would estimate based on the reported returns. Given the serial correlation evident in private alternative strategies, it is not surprising that the distressed hedge fund strategy exhibits higher serial correlation (0.36) than other hedge fund strategies.

Exhibit 20 The Effect of Serial Correlation on Volatility

Quarterly Data Dec. 1997–Sept. 2017	Serial Correlation	Volatility (reported returns)	Volatility (unsmoothed)
US Equities	0.03	17.0%	17.7%
Non-US Developed Market Equities	0.08	19.2%	20.8%
Emerging Market Equities	0.17	26.2%	30.8%
Governments	−0.01	4.9%	4.9%
Broad Fixed Income	0.02	3.4%	3.5%
High-Yield Credit	0.34	10.0%	14.3%
Inflation-Linked Bonds	0.12	5.0%	5.7%
Hedge Funds—Aggregate	0.15	8.1%	9.5%
HF Macro	0.08	5.4%	5.9%
HF Equity Market Neutral	0.17	3.5%	4.1%
HF Equity Hedged	0.19	10.7%	13.1%
HF Distressed	0.36	8.9%	13.0%

(continued)

Exhibit 20 (Continued)

Quarterly Data Dec. 1997–Sept. 2017	Serial Correlation	Volatility (reported returns)	Volatility (unsmoothed)
Commodities	0.14	25.2%	28.8%
Public Real Estate	0.15	20.4%	24.0%
Private Real Estate	0.85	4.6%	13.8%
Private Equity	0.38	10.7%	15.7%

7.1.2 Skewness and Fat Tails

A common and convenient assumption behind asset pricing theory, as well as models applied for asset allocation and risk analytics, is that asset returns are normally distributed. Both academic researchers and practitioners are widely aware of the limitations of this assumption, but no standard quantitative method to replace this assumption of normality exists. Skewness and excess kurtosis, or so-called “fat tails,” in the distributions of empirically observed asset returns may lead to underestimated downside risk measures in the case of both traditional and alternative asset classes. Non-normality of returns, however, can be more severe in private alternative asset class and certain hedge fund strategies than in most of the traditional asset classes.

In Exhibit 21, we show skewness and excess kurtosis parameters calculated based on 20 years of unsmoothed quarterly return data of various public and alternative asset classes. We also show 95% quarterly conditional value at risk (CVaR) estimates based on the assumption of normally distributed asset returns, as well as based on the observed (actual) distributions. Positive skewness indicates smaller downside risk potential, while negative skewness indicates greater downside risk potential. Excess kurtosis (i.e., a kurtosis parameter exceeding 0) similarly points toward greater downside risk than would be apparent from the numbers calculated using the assumption of normally-distributed returns. The observed (actual) CVaR estimates typically exceed the normal distribution-based CVaR figures when kurtosis is high and skewness is negative. Equity market-neutral hedge funds and private real estate have the biggest *relative* differences between the 95% normal distribution CVaR and the observed CVaR (columns C and D divided by column C). Both of these strategies have negative skewness and fairly high excess kurtosis. It’s interesting to note that distressed hedge funds similarly have high kurtosis and negative skewness, but the difference in tail risk measures becomes mainly visible at the 99% confidence level, where the extreme but infrequent losses may occur.

Exhibit 21 Normal Distribution Assumption and Observed Downside Risk Measures

	(A)	(B)	(C)	(D)	(E)	(F)
Unsmoothed Quarterly Data Dec. 1997–Sept. 2017	Skewness	Excess Kurtosis	95% CVaR (Normal Distribution)	95% CVaR (Observed)	99% CVaR (Normal Distribution)	99% CVaR (Observed)
US Equities	−0.51	0.43	−15.3%	−17.7%	−20.3%	−23.9%
Non-US Dev Equities	−0.19	0.29	−18.9%	−19.8%	−24.8%	−20.7%
Emerging Mkt Equities	−0.23	−0.03	−28.2%	−25.4%	−37.0%	−27.7%
Governments	0.59	0.39	−3.5%	−3.2%	−4.9%	−4.0%
Broad Fixed Income	−0.05	−0.41	−2.1%	−2.4%	−3.1%	−3.1%

Exhibit 21 (Continued)

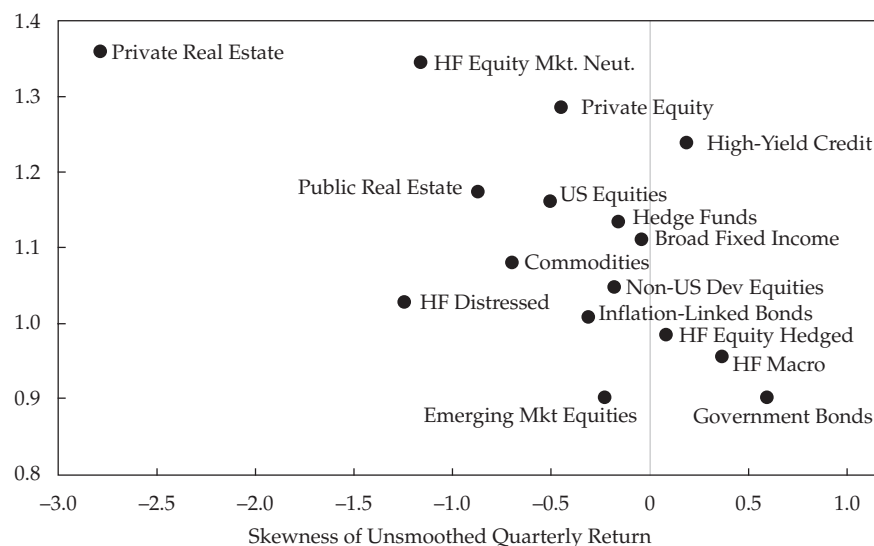
	(A)	(B)	(C)	(D)	(E)	(F)
<i>Unsmoothed</i> Quarterly Data Dec. 1997–Sept. 2017	Skewness	Excess Kurtosis	95% CVaR (Normal Distribution)	95% CVaR (Observed)	99% CVaR (Normal Distribution)	99% CVaR (Observed)
High-Yield Credit	0.18	6.14	−7.9%	−9.8%	−10.8%	−19.7%
Inflation-Linked Bonds	−0.32	1.08	−4.2%	−4.2%	−5.8%	−8.1%
Hedge Funds	−0.17	1.69	−7.6%	−8.6%	−10.3%	−9.7%
HF Macro	0.36	0.85	−4.3%	−4.1%	−6.0%	−5.1%
HF Equity Market Neutral	−1.17	3.55	−2.9%	−3.9%	−4.1%	−5.4%
HF Equity Hedged	0.08	2.24	−10.8%	−10.6%	−14.5%	−12.7%
HF Distressed	−1.25	3.52	−10.8%	−11.1%	−14.5%	−16.9%
Commodities	−0.71	1.62	−28.4%	−30.6%	−36.6%	−50.6%
Public Real Estate	−0.88	4.60	−20.9%	−24.5%	−27.7%	−40.2%
Private Real Estate	−2.80	9.62	−11.3%	−15.4%	−15.3%	−27.9%
Private Equity	−0.46	2.05	−12.2%	−15.7%	−16.7%	−22.6%

Source: Authors' calculations.

To further illustrate the impact of non-normality on the downside risk, in Exhibit 22 we compare the ratio of observed to normal CVaR measures with the skewness and excess kurtosis. Although the skewness or excess kurtosis alone doesn't fully explain the relative difference between observed and normal 95% CVaR (positive skewness may compensate high excess kurtosis or vice versa), we can see the evidence that higher kurtosis or more negative skewness usually increases the likely severity of any tail risk.

Exhibit 22 The Impact of Skewness and Kurtosis on Tail Risk

Ratio of Observed to Normal 95% CVaR



Source: Authors' calculations.

Analysts can choose to incorporate non-normality into their analyses in a few different ways. The most obvious and straightforward choice is to use empirically observed asset returns instead of working with the normal distribution. Still, in private investments where we typically have only quarterly return data, the analyses may be subject to serious limitations. Even with 20 years of quarterly return data, we have only 80 data points (and the industry has changed significantly over this time, further straining the validity of the data).

With sufficient data, analysts and researchers can capture the effects of fat tails by using advanced mathematical or statistical models:

- Time-varying volatility models (e.g., stochastic volatility), which assume that volatility is not constant over time but changes dynamically, can be used.
- Regime-switching models capture return, volatility, and correlation characteristics in different market environments (bull/bear or low volatility and moderate correlation vs. high volatility and elevated correlation). The combination of two or more normal distributions with different average returns, volatilities, and correlations could capture skewed and fat-tailed distributions.
- Extreme value theory and other fat-tailed distributions can be used when the analyst wants to focus on the behavior in the tails.

Although no single and uniformly accepted approach exists to address all of these quantitative challenges to the asset allocation exercise, a sound asset allocation process will do the following:

- 1 Adjust the observed asset class return data by unsmoothing the return series if the autocorrelation is significant.
- 2 Determine whether it is reasonable to accept an assumption of normal return distributions, in which case mean–variance optimization is appropriate to use.
- 3 Allow you to choose an optimization approach that takes the tail risk into account if the time series exhibits fat tails and skewness and if the potential downside risk would exceed the levels that would be observed with a normal distribution.

7.2 Monte Carlo Simulation

Monte Carlo simulation can be a very useful tool in asset allocation to alternative investments. In this section, we discuss two applications of this modeling approach. First, we discuss how we can simulate risk factor or asset return scenarios that exhibit the skewness and kurtosis commonly seen in alternative investments. Second, we illustrate simulation-based risk and return analytics over a long time horizon in a broad asset allocation context.

At a very high level, we can summarize the model construction process in the following steps:

- 1 Identify those variables that we would like to randomly generate in our simulation. These variables may be asset class total returns directly, or risk factors, depending on the model.
- 2 Establish the quantitative framework to generate realistic random scenarios for the selected asset class returns or risk factors. Here, the analyst faces several choices, including the following:
 - a What kind of time-series model are we using? Will it be a random walk? Or will it incorporate serial correlations and mean-reversion-like characteristics?

- b What kind of distribution should we assume for the shocks or innovations to the variables? Is normal distribution reasonable? Or, will we use some fat-tailed distribution model instead?
 - c Are volatilities and correlations stable over time? Or, do they vary across time?
- 3 If using a risk factor approach, convert the risk factors to asset or asset class returns using a factor-based model. In this reading, all our illustrations are based on linear factor models, but certain asset types with optionality need more-sophisticated models to incorporate convexity characteristics as well.
- 4 Further translate realistic asset class return scenarios into meaningful indicators. We can simultaneously model, for example, the investment portfolio and the liability of a pension fund, enabling us to assess how the funding ratio is expected to evolve over time. Or, in the case of an endowment fund, we can assess whether certain asset allocation choices would improve the probability of meeting the spending rate target while preserving the purchasing power of the asset base.

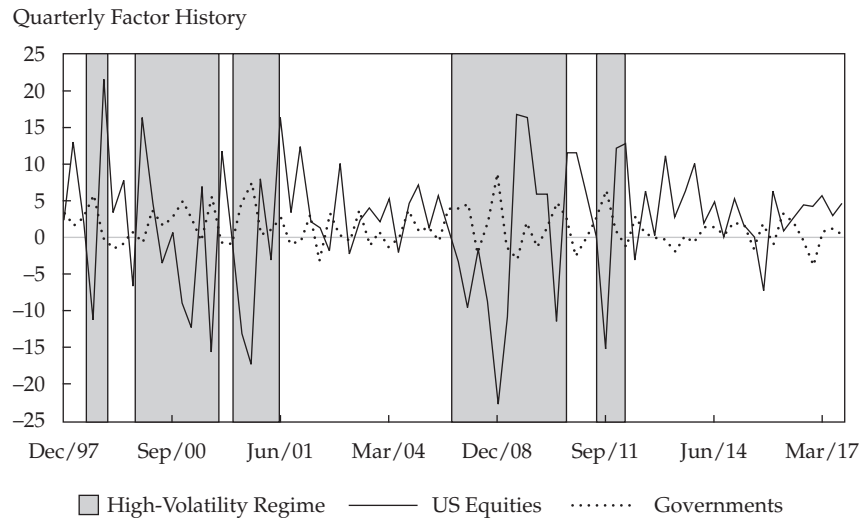
7.2.1 *Simulating Skewed and Fat-Tailed Financial Variables*

A fairly intuitive way of incorporating non-normal returns into the analysis is to assume that there are two (or more) possible states of the world. Individually, each state can be described by using a normal distribution (*conditional normality*), but the combination of these two distributions will not be normally distributed.¹¹ Next, we show a fairly simplified application for the public equities and government bonds. Note that the same approach can be applied to more asset classes as well, or it can be applied to risk factor changes rather than asset class returns.

For this illustration, we assume that the capital markets can be described by two distinct regimes—a “quiet period” (Regime 1) and a high-volatility state (Regime 2). Exhibit 23 shows the quarterly return history of the US equities and government bonds as well as the model’s more volatile regimes (the gray-shaded periods). It is easy to see that the Global Financial Crisis—and such earlier crisis periods as the 1997 Asian currency contagion, the 1998 Russian ruble crisis and LTCM meltdown, and the 2002 tech bubble burst—all belong to the high-volatility regimes. The mean return and volatility statistics for the full period as well as each of the two regimes can be found in Exhibit 24. Equities outperformed government bonds over the full observation period, and it’s interesting to see how dynamics changed between the quiet to the volatile periods. In the quiet period (Regime 1), equities outperformed bonds by around 4.6% quarterly, whereas in the volatile period (Regime 2), government bonds outperformed equities by more than 5%. The total return volatilities also jumped dramatically when the market switched from quiet to volatile periods. In addition, the correlation between equities and bonds was near zero during the quiet period but turned significantly negative (about -0.6) during the volatile period. Finally, we estimate that the low-volatility Regime 1 prevailed 62% of the time and the high-volatility Regime 2 prevailed 38% of the time.

¹¹ The estimation process of such models is beyond the scope of this reading. Readers interested in additional details are referred to Hamilton (1989) and Kim and Nelson (1999).

Exhibit 23 US Equities and Government Bonds Return History and Identification of High-Volatility Regimes



Source: Authors' calculations.

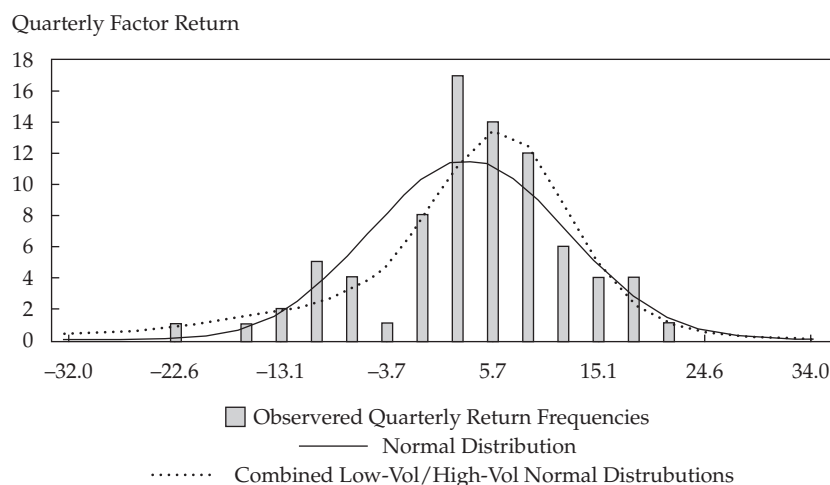
Exhibit 24 Return Statistics (1997–2017)

	Equities	Government Bonds
Quarterly Average Return	2.1%	1.2%
Quarterly Return Volatility	8.5%	4.5%
Skewness	−0.5	0.6
Kurtosis	0.4	0.4
Average Return in Regime 1	5.1%	0.5%
Average Return in Regime 2	−3.1%	2.4%
Volatility in Regime 1	5.5%	1.9%
Volatility in Regime 2	13.7%	3.8%
Correlation in Regime 1		0.0
Correlation in Regime 2		−0.6

If we want to capture only skewness and fat tails in a simulation framework, we just need the normal distribution parameters of the distinct regimes and the overall state probabilities of either Regime 1 or Regime 2. Then, the analyst would generate normally distributed random scenarios based on the different means and covariances estimated under the two (or more) regimes with the appropriate frequency of the estimated probability of being the quiet or hectic regimes. This mixture of high- and low-volatility normal distributions would lead to an altogether skewed and fat-tailed distribution of asset class return or risk factor changes. In practice, some may build a more dynamic, multi-step simulation model for a longer time horizon, in which case it's also important to estimate the probability of switching from one regime to another.

Exhibit 25 shows histograms of equity returns, overlaid with the fitted normal distribution and the combined distributions from our regime-switching model. As the chart illustrates, the combination of two normal distributions improves the distribution fit and introduces some degree of skewness and fat-tail characteristics.

Exhibit 25 Normal and Fat-Tailed Distribution Fit for US Equity Quarterly Returns



Source: Authors' calculations.

Several variations of regime-switching models are available. We have used a very basic set-up to illustrate the additional richness a regime-switching model can bring to the analysis. We could also apply a similar approach if we were to build asset classes using risk factors. We could overlay the non-normal distributions of the risk factors on the relevant asset class returns.¹²

7.2.2 Simulation for Long-Term Horizon Risk Assessment

We will now work through a practical application of Monte Carlo simulation in the context of asset allocation over a long time horizon. We simulate asset class returns in quarterly steps over a 10-year time horizon.¹³ Such models exhibit some degree of mean-reversion and also capture dynamic interactions across risk factors or asset classes over multiple time periods.

The volatilities, correlations, and other parameters of the time series model are estimated based on the past 20 years of unsmoothed asset class return data. The expected returns for the selected asset classes (shown in Exhibit 26), however, are not based on historical average returns but are illustrative, forward-looking estimates. Note that these return expectations mostly assume passive investments in the specific asset class and don't include the possible value-added from (or lost through) active management. Hedge funds are the exception, of course, because by definition hedge

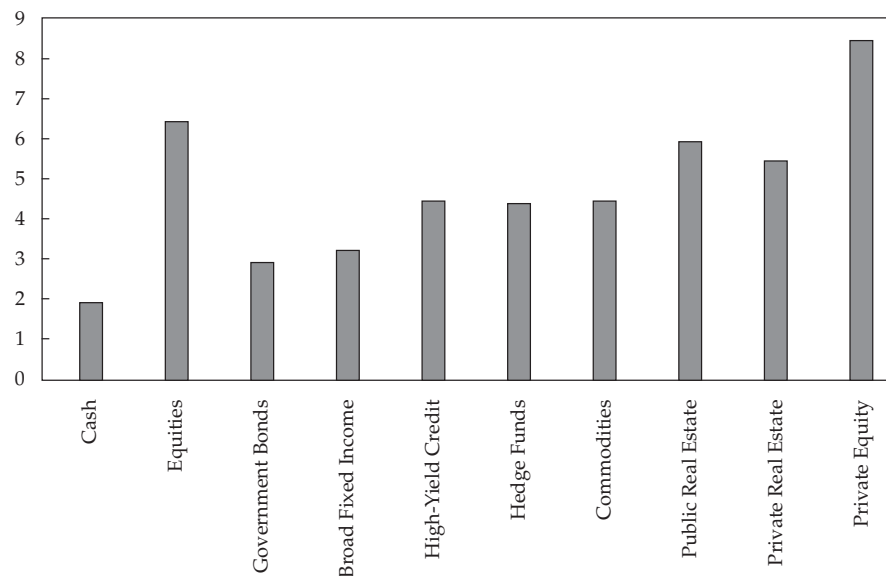
¹² In this reading, we assume that various asset classes have constant risk factor sensitivities over time, an assumption that can be relaxed in practice. For example, Berkelaar, Kobar, and Kouwenberg (2009) present time-varying risk factors for various hedge fund strategies in a similar Monte Carlo simulation framework.

¹³ To ensure that we not only capture short-horizon risks but also properly assess long-term asset return behavior characteristics, we capture the linear interdependencies among multiple time series by working with a vector-autoregressive model.

funds are actively managed investment strategies rather than a true stand-alone asset class. The expected returns are also generally assumed to be net of fees to make them comparable across asset classes.

Asset class-level expected returns are critically important to an asset allocation exercise. Return expectations should be reflective of the current market conditions—including valuations, levels of interest rates, and spreads. Setting return expectations requires a combination of objective facts (e.g., the current yield and spread levels) and judgment (how risk factors and valuation ratios might change from the current levels over the relevant time horizon).

Exhibit 26 Asset Class Expected Returns



Source: Authors' data.

In this example, we compare three possible portfolios:

- A portfolio 100% invested in government bonds
- A portfolio allocated 50% to global public equities and 50% to broad fixed income
- A diversified “endowment portfolio” allocated 40% to global public equities, 15% to fixed income, 20% to broad hedge funds, 15% to private equity, 5% to private real estate, and 5% to commodities

Exhibit 27 shows the risk and return statistics for the three portfolios. VaR and CVaR downside risk measures focus over the shorter, quarterly, and 1-year time horizons. The worst drawdown and the cumulative annualized total return ranges are expressed over a 10-year time horizon.

Exhibit 27 Portfolio Risk and Return Estimates

	Government Bond Portfolio	50/50 Portfolio	Endowment Portfolio
Expected Geometric Return over 10 Years	2.3%	5.6%	7.0%
Annual Total Return Volatility	4.2%	6.6%	11.2%
95% VaR over Q/Q (quarter over quarter)	-3.1%	-2.9%	-4.6%
95% VaR over 1 Year	-5.2%	-4.2%	-9.1%
95% CVaR over Q/Q	-4.0%	-3.9%	-6.4%
95% CVaR over 1 Year	-6.9%	-6.6%	-13.1%
99% VaR over Q/Q	-4.5%	-4.6%	-7.5%
99% VaR over 1 Year	-7.9%	-8.1%	-15.6%
99% CVaR over Q/Q	-5.2%	-5.5%	-8.7%
99% CVaR over 1 Year	-9.2%	-10.3%	-18.7%
Worst Drawdown over 10 Years	-19.8%	-22.5%	-36.9%

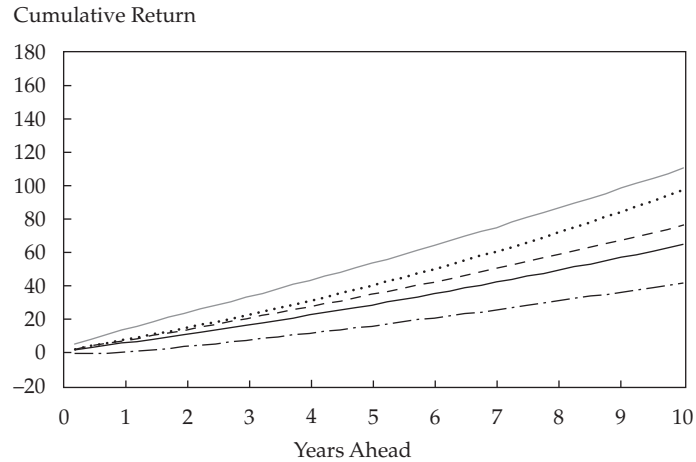
10-Year Return Distribution	Government Bond Portfolio	50/50 Portfolio	Endowment Portfolio
5% Low	0.0%	2.3%	1.9%
25% Low	1.2%	4.2%	4.8%
50% (Median)	2.3%	5.6%	7.0%
75% High	3.1%	7.0%	9.1%
95% High	4.5%	9.0%	12.2%

From Exhibit 27, we see that the multi-asset endowment portfolio generates a significantly higher return than the portfolio exclusively invested in government bonds, albeit at much higher downside risk as measured by VaR, CVaR, or worst drawdown. This table alone, however, is insufficient to determine which investment alternative a particular investor should choose.

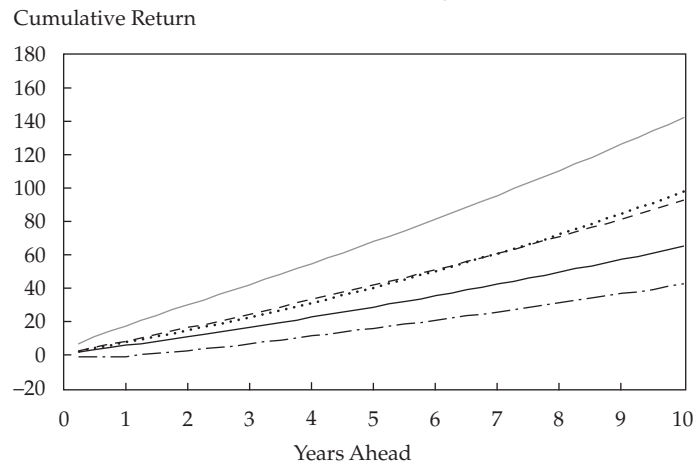
Consider the case of a university endowment fund. Let's assume that the investment objective is to support a 5% annual spending rate as well as to preserve the purchasing power of the asset base over the 10-year time horizon. We use the same simulation engine to generate the analytics of Exhibit 28. Here, we plot the expected cumulative total return within a ± 1 standard deviation range together with the cumulative spending rate, as well as the spending rate augmented with inflation on a cumulative basis. The latter two variables represent the investment target, so we can meaningfully interpret the return potential of the two investment choices in the context of the investment objective. The 50% equities/50% government bond portfolio initially appeared to be a lower risk alternative in Exhibit 27, but Exhibit 28 shows that this choice is more likely to fall short of the return target, given that its median return of 5.6% is less than the nominal return target of approximately 7% (the 5% spending rate plus 2% inflation). At the same time, the endowment portfolio's 7% median return indicates that it would have a better chance of meeting the investment objective.

Exhibit 28 Cumulative Total Return Cones Simulated over a 10-Year Horizon

A. 50/50 Portfolio



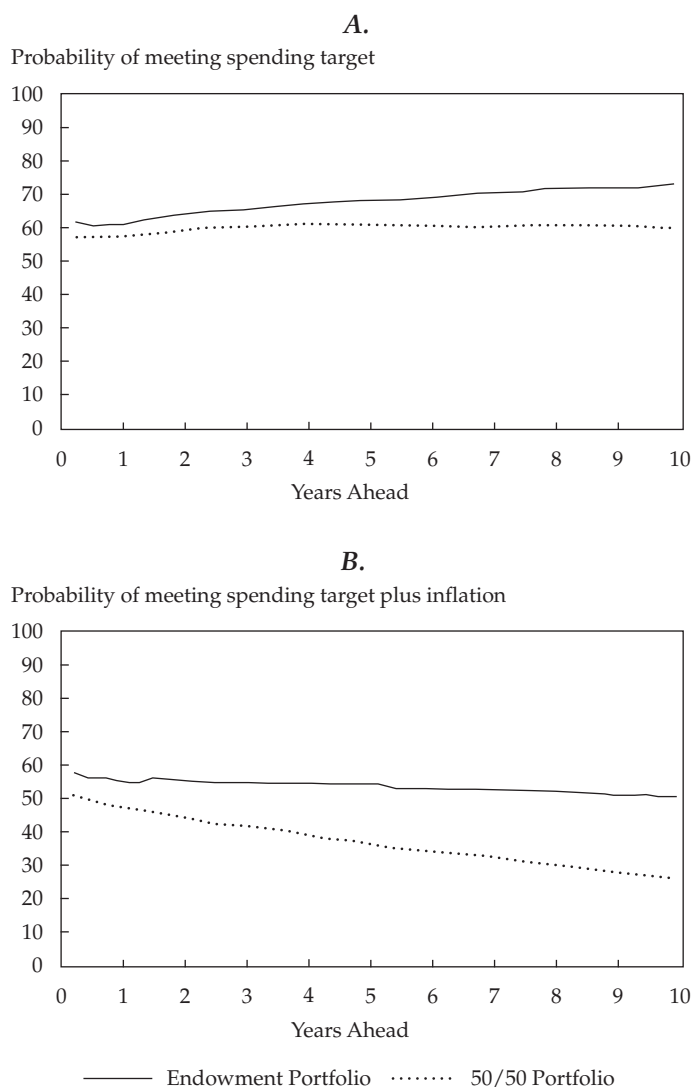
B. Endowment Portfolio



— Cumulative Spending Cumulative Spending + Inflation
 — Exp. Cum. Return - 1 St. Dev. - - - - Expected Cumulative Return
 - · - - - Exp. Cum. Return + St. Dev.

Exhibit 29 shows the probability of meeting the spending rate as well as the spending rate plus inflation at any point in time over the investment horizon. If risk is defined as the probability of falling short of meeting the return target (rather than the asset-only perspective of risk, volatility), the otherwise lower-risk 50% equities and 50% government bond portfolio becomes the higher risk alternative.

Exhibit 29 Estimated Probability of Achieving the Investment Goal



7.3 Portfolio Optimization

Portfolio optimization for asset allocation has been covered in great detail in earlier readings. Here we focus on some special considerations for optimization in the context of alternative investments.

7.3.1 Mean–Variance Optimization without and with Constraints

We mentioned earlier that mean–variance optimization would likely over-allocate to alternative, mainly illiquid, asset classes given their higher expected returns and potentially underestimated risk. Some investors impose minimum and maximum constraints on various asset classes to compensate for this bias. Let's consider the ramifications of this approach.

Here, the input data for our optimization are comprised of the asset class expected returns depicted in Exhibit 26, while the covariance matrix is based on the unsmoothed asset class return history over the past 20 years. Exhibit 30 shows the optimized portfolio allocations generated by the mean–variance optimization without and

with constraints. Each column in these bar charts represents an optimized portfolio allocation subject to a return target. The exhibit progresses from low-return targets on the left to high-return targets on the right. In total, we show 20 possible portfolio allocations first without and then with constraints.

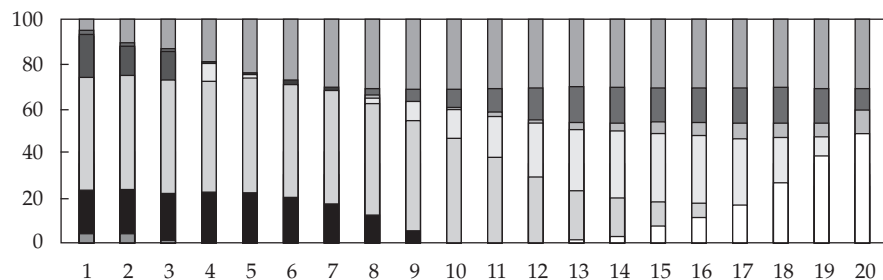
By reviewing Panel B of Exhibit 30, we can see that the unconstrained portfolio allocations are dominated by cash and fixed income at the lower end of the risk spectrum, and private equity becomes the dominant asset class for higher risk portfolios. Optimization is quite sensitive to the input parameters: It's quite common to see allocations concentrated in a small number of asset classes. Thus, investors shouldn't take the unconstrained output as the "best" allocation. Small changes in the input variables could lead to large changes in the asset allocations.

Because investors would potentially reject the raw, concentrated output of unconstrained mean–variance optimization, we also ran a constrained optimization where we capped private equity and hedge fund allocations at 30% each, private real estate at 15%, and major public asset classes at 50% each. The resulting constrained allocations, shown in the Panel A of Exhibit 30, are less concentrated and appear to be more diversified.

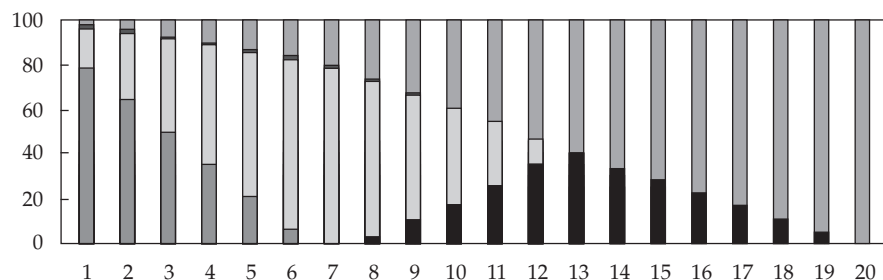
Exhibit 31 depicts the mean–variance efficient frontiers corresponding to the optimized portfolio allocations of Exhibit 30. Note that both frontiers contain 20 dots, each representing an optimized portfolio. The numbers under each bar in Exhibit 30 identify the allocation associated with each of the dots on the efficient frontiers in Exhibit 31 (e.g., the allocation associated with portfolio 20 on the efficient frontier in Exhibit 31 is the one shown at the rightmost edge of Exhibit 30).

Exhibit 30 Unconstrained and Constrained Asset Allocations

A. Constrained Portfolios



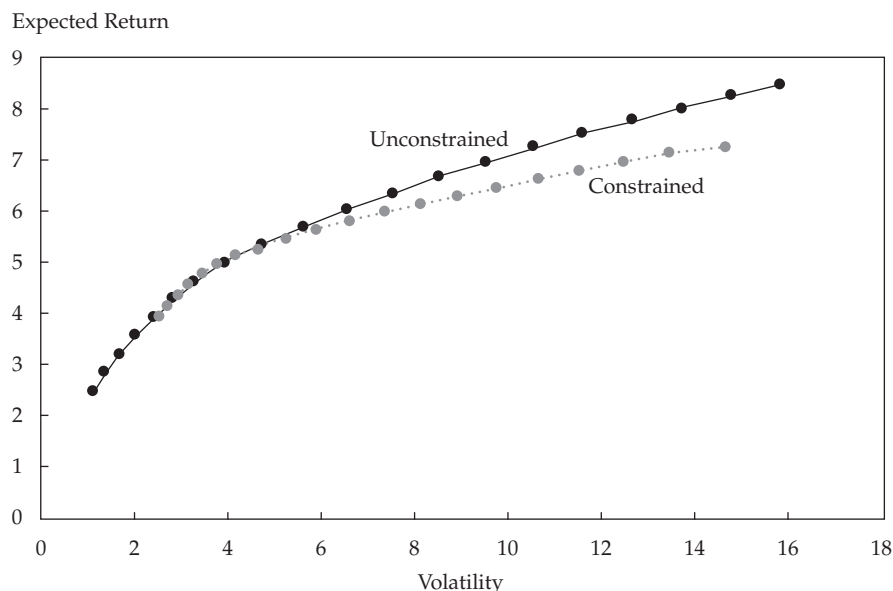
B. Unconstrained Portfolios



■ Cash ■ Equities ■ Government Bonds ■ Broad Fixed Income
 ■ High-Yield Credit ■ Hedge Funds ■ Commodities
 ■ Public Real Estate ■ Private Real Estate ■ Private Equity

Note that the constrained efficient frontier runs below its unconstrained peer (Exhibit 31). This is not unexpected, as we artificially prohibited the optimization from selecting the most efficient allocation it could get based on the available quantitative data.

Exhibit 31 Unconstrained and Constrained Mean–Variance Efficient Frontiers



In practice, many investors are aware of the limits of the mean–variance framework—the possible underestimation of the true fundamental risks based on the reported returns of private investments—and they may also have in mind other constraints, such as capping illiquidity. Thus, introducing maximum and minimum constraints for certain asset classes may be a reasonable, although exogenous, adjustment to the quantitative optimization. However, not even constrained optimized allocations should be accepted without further scrutiny. In fact, similar volatility and expected return profiles can be achieved with a wide variety of asset allocations. So, although optimized portfolios may serve as analytical guidance, it’s important to validate whether a change to an asset allocation policy results in a significant return increment and/or volatility reduction.

7.3.2 Mean–CVaR Optimization

Portfolio optimization can also improve the asset allocation decision through a risk management lens. An investor who is particularly concerned with the downside risk of a proposed asset allocation may choose to minimize the portfolio’s CVaR rather than its volatility relative to a return target.¹⁴ If the portfolio contains asset classes and investment strategies with negative skewness and long tails, the CVaR lens could materially alter the asset allocation decision. Minimizing CVaR subject to an expected

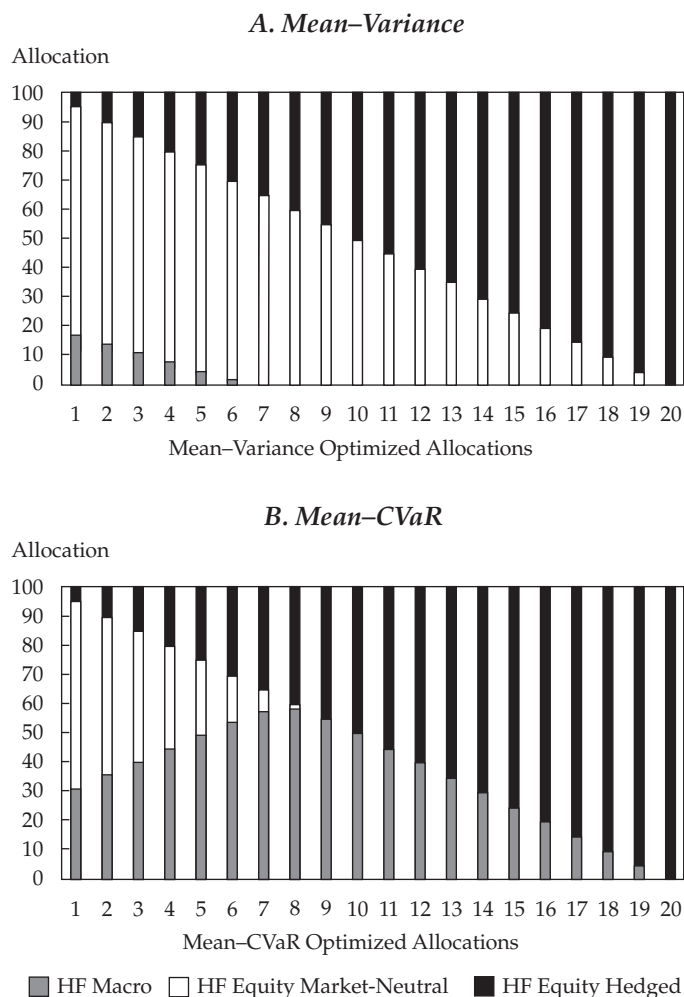
¹⁴ Because we are optimizing allocation to asset classes, the CVaR tail risk measure quantifies *systematic* asset class level risks. Individual asset managers or securities may impose additional idiosyncratic risk when the asset allocation is implemented in practice.

return target is quantitatively much more complex than portfolio variance minimization: It requires a large number of historical or simulated return scenarios to properly incorporate potential tail risk into the optimization.¹⁵

Our first illustration is applied to three hedge fund strategies: macro, equity market neutral, and long/short equity hedged. Our expected returns for the three strategies are 3.6%, 3.6%, and 6.0%, respectively. The observed return distribution for macro strategy is fairly normal, while equity market neutral exhibits negative skew and the highest kurtosis of these three strategies (see Exhibit 21).

Panels A and B of Exhibit 32 compare 20 possible portfolio allocations generated by the mean–variance and mean–CVaR optimizations, varying from low to high risk/return profiles. The allocation to long/short equity hedged (the black bar) is similar under both the MVO and CVaR approaches. The macro strategy receives a much higher allocation using the CVaR approach than it does using the MVO approach.

Exhibit 32 Hedge Fund Allocations



¹⁵ Technical details are provided by Rockafellar and Uryasev (2000).

Exhibit 33 compares portfolio #12 from the mean–variance efficient frontier to portfolio #12 from the mean–CVaR efficient frontier. Both portfolios allocated 60% to the long/short equity strategy. Under the CVaR-optimization approach, the remaining 40% of the portfolio is invested in global macro. Under the MVO approach, the remaining 40% of the portfolio is invested in equity market-neutral.

Let's compare the portfolio volatilities and downside risk measures. The mean–CVaR portfolio has higher volatility (7.8% vs 7.3%) but lower tail risk (–6.8% vs –7.7%). Exhibit 33 also shows a third portfolio, which evenly *splits* the 40% not allocated to equity-hedged between global macro and equity market neutral. The volatility of this portfolio lies between the two optimal portfolios. Although nominally more diversified than either of the #12 portfolios from the optimization, its CVaR is worse than that of the mean–CVaR optimized portfolio (but still better than that of the MVO portfolio). An investor may have qualitative considerations that warrant including this more-diversified portfolio among the options to be evaluated.

Exhibit 33 Mean–Variance and Mean–CVaR Efficient Hedge Fund Allocations

	Asset Allocation			Portfolio Characteristics			
	Macro	Equity Market Neutral	Long/Short Equity	Expected Return	Volatility	95% VaR	95% CVaR
Mean–Variance Optimal	0.0%	40.0%	60.0%	5.0%	7.3%	–3.7%	–7.7%
Mean–CVaR Optimal	40.0%	0.0%	60.0%	5.0%	7.8%	–4.1%	–6.8%
Combination	20.0%	20.0%	60.0%	5.0%	7.5%	–3.7%	–7.3%

Exhibit 34 compares the optimal allocations of a broad asset class portfolio through the mean–variance and mean–CVaR lenses. In this example, the optimal allocations were selected subject to a 6.8% expected return target. Both approaches allocated a significant portion of the portfolio to private equity and hedge funds (30% each). A notable difference, however, is in the allocation to public and private real estate. Where the MVO approach allocated 22% to the combined real estate categories, the CVaR approach allocated nothing at all to either real estate category. We can identify the reason for this by referring back to Exhibit 21: The public and private real estate categories are characterized by 99% CVaRs of –40.2% and –27.9%, respectively.

Exhibit 34 Mean–Variance and Mean–CVaR Efficient Multi-Asset Portfolios

	Asset Allocation					Portfolio Characteristics			
	Equities	Govt Bonds	Hedge Funds	Public Real Estate	Private Real Estate	Private Equity	Expected Return	Volatility	99% CVaR
Mean–Variance Optimal	18%	0%	30%	7%	15%	30%	6.8%	11.5%	–20.7%
Mean–CVaR Optimal	34%	6%	30%	0%	0%	30%	6.8%	12.1%	–15.6%

EXAMPLE 6**Asset Allocation Recommendation**

The CIO (chief investment officer) of the International University Endowment Fund (the Fund) is preparing for the upcoming investment committee (IC) meeting. The Fund's annual asset allocation review is on the agenda, and the CIO plans to propose a new strategic asset allocation for the Fund. Subject to prudent risk-taking, the recommended asset allocation should offer

- the highest expected return and
- the highest probability of achieving the long-term 5% real return target.

The inflation assumption is 2%.

In addition, the risk in the Fund is one factor that is considered when lenders assign a risk rating to the university. The university's primary lender has proposed a loan covenant that would trigger a re-evaluation of the university's creditworthiness if the Fund incurs a loss greater than 20% over any 1-year period.

The investment staff produced the following tables to help the CIO prepare for the meeting.

Alternative	Asset Allocation						
	Cash	Public Equity	Govt	Credit	Hedge Fund	Real Estate	Private Equity
A	5.0%	60.0%	30.0%	5.0%	0.0%	0.0%	0.0%
B	4.0%	50.0%	16.0%	5.0%	10.0%	5.0%	10.0%
C	2.0%	40.0%	8.0%	5.0%	18.0%	7.0%	20.0%
D	1.0%	30.0%	5.0%	4.0%	20.0%	10.0%	30.0%
E	2.0%	40.0%	3.0%	3.0%	15.0%	7.0%	30.0%
F	2.0%	50.0%	3.0%	0.0%	10.0%	5.0%	30.0%
G	1.0%	56.0%	3.0%	0.0%	10.0%	0.0%	30.0%

Alternative	Portfolio Characteristics							
	Expected Return	Volatility	10-Year Horizon:					Probability of Purchasing Power Impairment
			1-Year 99% VaR	1-Year 99% CVaR	5th Percentile Return	95th Percentile Return	Probability of Meeting 5% Real Return	
A	6.0%	9.0%	-12.4%	-15.0%	1.6%	10.5%	37.0%	7.1%
B	6.7%	10.3%	-14.6%	-17.3%	2.0%	11.4%	46.1%	4.3%
C	7.1%	11.1%	-15.8%	-18.8%	2.2%	12.2%	52.1%	3.2%
D	7.4%	11.5%	-16.3%	-19.4%	2.4%	12.6%	56.1%	2.5%
E	7.7%	12.3%	-17.4%	-20.6%	2.4%	13.2%	58.8%	2.8%
F	7.8%	13.0%	-18.5%	-21.8%	2.2%	13.7%	60.8%	3.6%
G	7.9%	13.5%	-19.3%	-22.7%	2.1%	14.1%	61.0%	4.0%

Notes:

- 1-year horizon 99% VaR: the lowest return over any 1-year period at a 99% confidence level (i.e., only a 1% chance to experience a total return below this threshold).
- 1-year horizon 99% CVaR: the expected return if the return falls below the 99% VaR threshold.
- 5th and 95th percentile annualized returns over a 10-year time horizon: a 90% chance that the annualized 10-year total return will fall between these two figures

- probability of purchasing power impairment¹⁶: as defined by the IC, the probability of losing 40% of the endowment's purchasing power over 10 years after taking gifts to the endowment, spending from the endowment, and total return into account.

-
- 1 Which asset allocation is *most likely* to meet the committee's objective and constraints?

Solution to 1:

Portfolio D. Portfolios E, F, and G have 1-year, 99% CVaRs, which, if realized, would trigger the loan covenant. Portfolio D has the next highest probability of meeting the 5% real return target and the lowest probability of purchasing power impairment. Portfolios A, B, and C have lower probabilities of meeting the return targets and higher probabilities of purchasing power impairment.

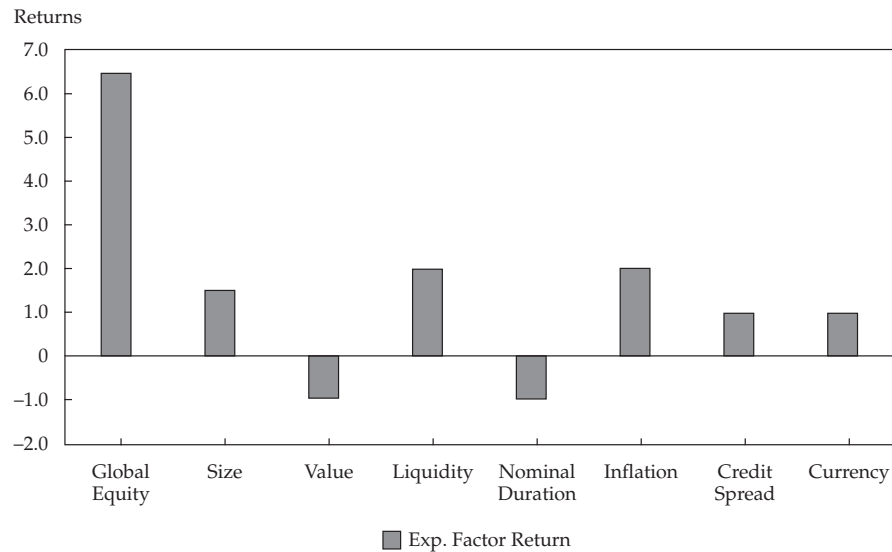
7.4 Risk Factor-Based Optimization

Increasingly, investors believe that viewing investment decisions through a risk factor lens (e.g., growth, inflation, credit risk) may improve the investment process. Separating fundamentally similar investments, like public and private equities, into distinct asset classes ignores the probability that both are exposed to the same risk factors. In this section, we will work through an asset allocation example using a risk factor lens.

Let's assume that an investor starts the asset allocation exercise by first allocating the overall risk budget across the main risk factors.¹⁷ Instead of setting expectations for distinct asset classes, she may start thinking about the return expectations and correlation of the fundamental risk factors. Exhibit 35 shows her return expectations for the risk factors described in Exhibit 14. In this illustration, the global equity risk factor (a practical proxy for macroeconomic-oriented "growth") is expected to generate the highest return. She expects the duration and value factors to generate negative returns because stronger economic growth fueled by advances in technology would lead to rising rates and better returns for growth stocks. She is concerned about rising inflation, so she has assigned a positive expected return to the inflation factor.

¹⁶ Similar measures of risk are proposed by Swensen (2009) in the context of endowment funds.

¹⁷ Approaches to asset allocation and portfolio construction are expanding as the understanding of risk factors is increasing. A risk parity approach to asset allocation, for example, would allocate total risk in equal portion to the selected risk factors.

Exhibit 35 Expected Factor Returns

Using these returns and the historical factor volatilities and correlations, we can optimize the risk factor exposure by minimizing factor-implied risk subject to a total return target of 6.5%. The black bars in Exhibit 36 show these optimal factor exposures. Note that the target exposures of the value and nominal duration factors are positive, although the associated expected factor returns are negative. The model allocates to these factors for their diversification potential because they are negatively correlated with other risk factors. Duration and equity factors have a correlation of -0.6 , whereas value and equity factors have a correlation of -0.3 based on the data used for this illustration.

We have established optimal risk factor exposures, so now we must implement this target using actual investments. Some investors may have access to only public market investments, while other investors may also have access to private illiquid investments. The gray and white bars in Exhibit 36 illustrate the two possible implementations of the target factor exposures. Portfolio 1 assumes the investor is limited to public market investments. Portfolio 2 uses both public market investments and private, illiquid investments. The portfolio allocation details are displayed in Exhibit 37.

Exhibit 36 Optimal Risk Factor Allocations and Associated Asset Class Portfolios

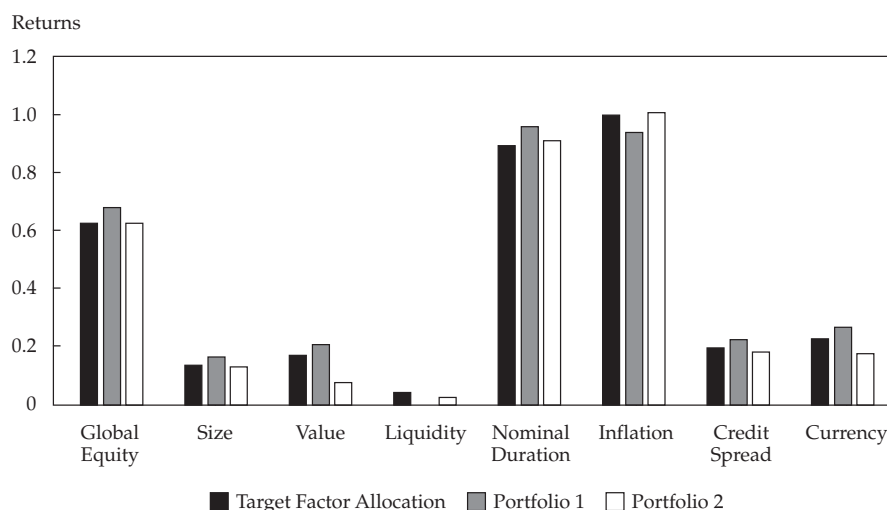


Exhibit 37 Asset Class Portfolios Designed Based on Optimal Risk Factor Allocations

	Portfolio 1	Portfolio 2
Domestic Equities; <i>Value Tilt</i>	21.0%	13.0%
Non-Domestic Developed Market Equities; <i>Value Tilt</i>	21.0%	13.0%
Foreign Emerging Market Equities	21.0%	12.0%
Government Bonds	0.0%	5.0%
Broad Fixed Income	10.0%	0.0%
High-Yield Credit	2.0%	3.0%
Inflation-Linked Bonds	7.0%	0.0%
Hedge Funds	15.0%	10.0%
Commodities	3.0%	4.0%
Public Real Estate	0.0%	12.0%
Private Real Estate	0.0%	13.0%
Private Equity	0.0%	15.0%
Total	100.0%	100.0%
Expected Return	6.2%	6.9%
Volatility	13.5%	13.2%

Even though they have similar factor exposures, you can see some significant differences in the asset class allocations of the two portfolios. Portfolio 1 allocates 63% to public equities, whereas Portfolio 2 allocates 35% to public equities plus 15% to private equity for its higher return potential. Portfolio 1 allocates 18% to alternatives (15% in hedge funds and 3% in commodities, two of the most liquid alternative asset classes), while Portfolio 2 has allocated 54% to alternatives (10% hedge funds, 4% commodities, 12% public real estate, 13% private real estate, and 15% private equity). Portfolio 1 achieves its inflation sensitivity by allocating to inflation-linked bonds

and commodities. Portfolio 2 achieves its desired exposure to the inflation factor through a combined allocation to real estate and commodities. The volatility of the two portfolios is similar, but Portfolio 2 is able to achieve a higher expected return given its ability to allocate to private equity.

Although a risk factor-driven approach is conceptually very elegant, we must mention a few caveats:

- While generally accepted asset class definitions provide a common language among the investment community, risk factors may be defined quite differently investor-to-investor. It's important to establish a common understanding of factor definitions and factor return expectations among the parties to an asset allocation exercise. This includes an agreement as to what financial instruments can be used to best match the factor exposures if they are not directly investable.
- Correlations among risk factors, just like correlations across asset classes, may dramatically shift under changing market conditions; thus, careful testing needs to be applied to understand how changing market conditions will affect the asset allocation.
- Some factor sensitivities are stable (like the nominal interest rate sensitivity of government bonds), while others are very unstable (like the inflation sensitivity of commodities). Factor sensitivities also need to be very carefully tested to validate whether the invested portfolio would truly deliver the desired factor exposures and not deliver unintended factor returns.

EXAMPLE 7

Selecting an Asset Allocation Approach

- 1 You have a new client who has unexpectedly inherited a substantial sum of money. The client is in his early 30s and newly married. He has no children and no other investible assets. What asset allocation approach is most suitable for this client?
- 2 Your client is a tax-exempt foundation that recently received a bequest doubling its assets to €200 million. There is an outside investment adviser but no dedicated investment staff; however, the six members of the investment committee (IC) are all wealthy, sophisticated investors in their own right. The IC conducts an asset allocation study every three years and reviews the asset allocation at its annual meeting. The current asset allocation is 30% equities, 20% fixed income, 25% private equity, and 25% real estate. Three percent of assets are paid out annually in grants; this expenditure is covered by an annuity purchased some years ago. The foundation's primary investment objective is to maximize returns subject to a maximum level of volatility. A secondary consideration is the desire to avoid a permanent loss of capital. What asset allocation approach is most suitable for this client?

Solution to 1:

Mean–variance optimization with Monte Carlo simulation is most appropriate for this client. He has limited investment expertise, so your first responsibility is to educate him with respect to such basic investment concepts as risk, return, and diversification. A simple MVO approach supplemented with Monte Carlo simulation to illustrate potential upside and downside of an asset allocation choice is mostly likely to serve the asset allocation and investment education needs.

Solution to 2:

Given the sophistication and investment objectives of the IC members, using a mean–CVaR optimization approach is appropriate to determine the asset allocation. This client has a more sophisticated understanding of risk and will appreciate the more nuanced view of risk offered by mean–CVaR optimization. Given the portfolio's exposure to alternative investments, the asset allocation decision will be enhanced by the more detailed picture of left-tail risk offered by CVaR optimization (the risk of permanent loss) relative to mean–variance optimization. The lack of permanent staff and a once-per-year meeting schedule suggest that a risk factor-based approach may not be appropriate.

LIQUIDITY PLANNING**8**

Earlier, we addressed various aspects of liquidity associated with investing in alternative asset classes. In this section, we focus on multi-year horizon liquidity planning for private investments.

When managing portfolios that contain allocations to alternative investments, managing liquidity risk takes on critical importance. We need to ensure that we have sufficient liquidity to meet interim obligations or goals, which might include:

- periodic payments to beneficiaries (e.g., a pension fund's retirement benefit payments, an endowment fund's distributions to support operating expenses, or a family office's ordinary expenses);
- portfolio rebalancing or funding new asset manager mandates; or
- fulfilling a commitment made to a private investment fund when the general partner makes the capital call.

Alternative investments pose unique liquidity challenges that must be explicitly addressed before committing to an alternative investment program. Private investments—including private equity, private real estate, private real assets, and private credit—represent the most illiquid components of an investment portfolio. Private investments usually require a long-term commitment over an 8- to 15-year time horizon. An investor contributes capital over the first few years (the investment period) and receives distributions in the later years. Combined with the call down (or drawdown) structure of a private investment fund, this creates a need to model a hypothetical path to achieving and maintaining a diversified, fully-invested allocation to private investments. Here we will explore the challenges with private investment liquidity planning with three primary considerations:

- 1 How to achieve and maintain the desired allocation.
- 2 How to handle capital calls.
- 3 How to plan for the unexpected.

8.1 Achieving and Maintaining the Strategic Asset Allocation

Strategic planning is required to determine the necessary annual commitments an investor should make in order to reach and maintain the long-term target asset allocation. Large private investors often use a liquidity forecasting model for their private investment programs. Here, we illustrate one such model based on work published by Takahashi and Alexander (2001). We also discuss private investment commitment

pricing as an application of this model. This model is only one possible way to forecast private investment cash flows; investors may develop their own model using their own assumptions and experience.

We will illustrate this model with a hypothetical capital commitment (CC) of £100 million to a fund with a contractual term (L) of 12 years.

We begin by modeling the capital contributions (C) to the fund. Certain assumptions must be made regarding the rate of contribution (RC). We'll assume that 25% is contributed in the first year and that 50% of the remaining commitments are contributed in each of the subsequent years:

$$\text{Year 1: } £100 \text{ million} \times 25\% = £25 \text{ million}$$

$$\text{Year 2: } (£100 \text{ million} - £25 \text{ million}) \times 50\% = £37.5 \text{ million}$$

$$\text{Year 3: } (£100 \text{ million} - £25 \text{ million} - £37.5 \text{ million}) \times 50\% = £18.75 \text{ million}$$

and so on.

The capital contribution (C) in year t can be expressed with the following formula:

$$C_t = RC_t \times (CC - PIC_t) \quad (1)$$

where PIC denotes the already paid-in capital.

Alternatively, we can express this in words:

$$\text{Capital Contribution} = \text{Rate of Contribution} \times (\text{Capital Commitment} - \text{Paid-in-Capital})$$

In practice, the investment period is often limited to a defined number of years. It's also possible that not all of the committed capital would be called.

The next step is to estimate the periodic distribution paid to investors. Distributions (D) are a function of the net asset value (NAV). From one year to the next, the NAV rises as additional capital contributions are made and as underlying investments appreciate (G). NAV declines as distributions are made (or as assets are written down).

G is equal to the expected growth rate. If the partnership investment develops as anticipated, then the fund's IRR would be equal to this rate. For our example, we set G equal to 13%.

To estimate the expected annual distribution payments, we need to make an assumption about the pattern of distributions. For example, an analyst may assume that the fund does not distribute any money in Year 1 or Year 2 but distributes 10% of the prevailing net asset value in Year 3, 20% in Year 4, 30% in Year 5, and 50% of the remaining balance in each of the remaining years. In the case of real estate funds, it is also possible that there is a pre-defined minimum annual distribution rate (called the "yield" in this context).¹⁸ Once we have the annual rates of distribution determined, the annual amount distributed is calculated by the following formula:

$$D_t = RD_t [NAV_{t-1} \times (1 + G)] \quad (2)$$

where

$$NAV_t = [NAV_{t-1} \times (1 + G)] + C_t - D_t \quad (3)$$

Again, in words:

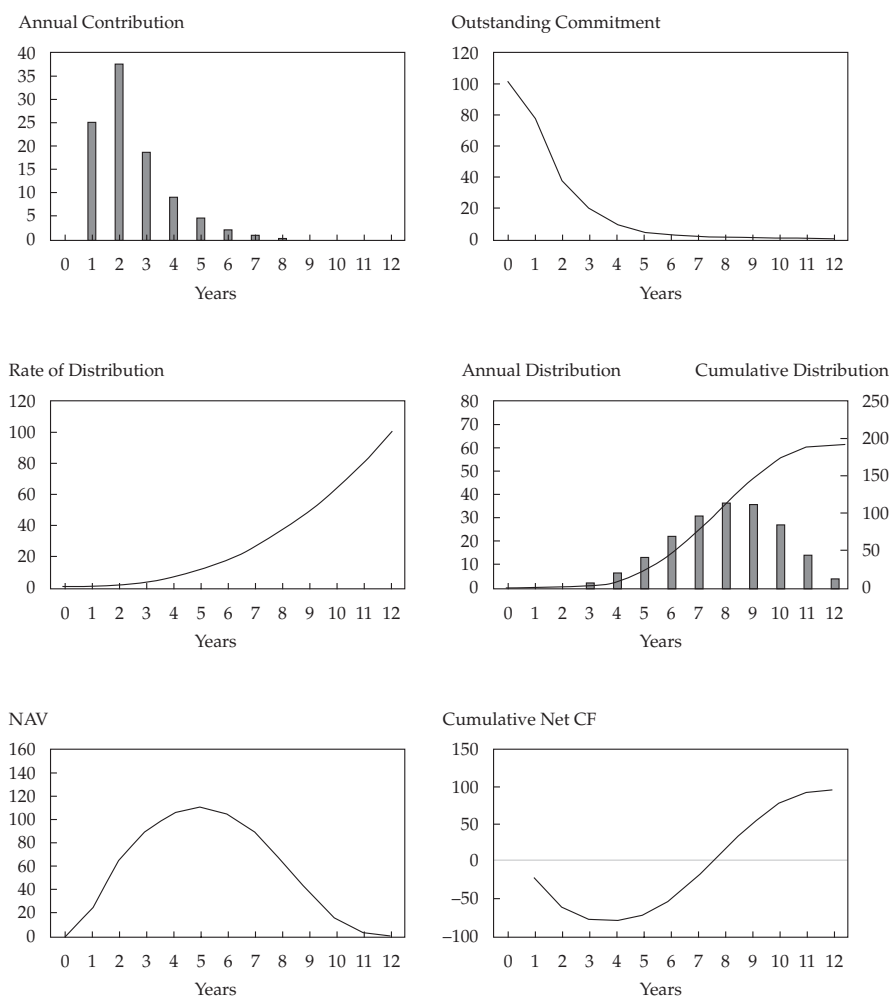
$$\text{Distributions} = \text{Rate of Distribution at time } t \times [\text{NAV} \times (1 + \text{Growth Rate})], \text{ and}$$

¹⁸ Takahashi and Alexander (2001) specify the annual rate of distribution (RD) as a function. The formula of the rate of distribution is a function of parameter called the "bow" (B). This parameter determines how early or late in the fund's life distributions would concentrate. The calculated rate of distribution is expressed by the following formula: $RD_t = (t/L)^B$. In general, if the "bow" parameter is set small, distribution rate would increase in the earlier years and investors would get their capital and gains back earlier in the fund's life. If the "bow" is set higher, the distributions would be back-loaded toward the final years and investors' capital would be invested for a longer period.

$$\text{NAV at time } t = \text{prior NAV} \times (1 + \text{Growth Rate}) + \text{Capital Contribution} - \text{Distributions}$$

In Exhibit 38, we display the forecasted annual capital contributions, outstanding commitment forecast, distributions, NAV, and cumulative net cash flow for a private investment fund with a 12-year life. We assume that 25% of the committed capital is contributed in the first year and that 50% of the remaining commitments are contributed in each of the subsequent years. We set the RD_t distribution rates such that the yearly distribution rates would increase fairly gradually.¹⁹ We assume a 13% growth rate from the investments in this fund.

Exhibit 38 Expected Annual Contribution, Outstanding Commitment, Rate of Distribution, Annual Distribution, NAV, and Net Cash Flow of a Hypothetical Private Investment Fund



The corresponding annual RD_t rates are displayed in Exhibit 39.

¹⁹ We set the “bow” (B) parameter equal to 2.5.

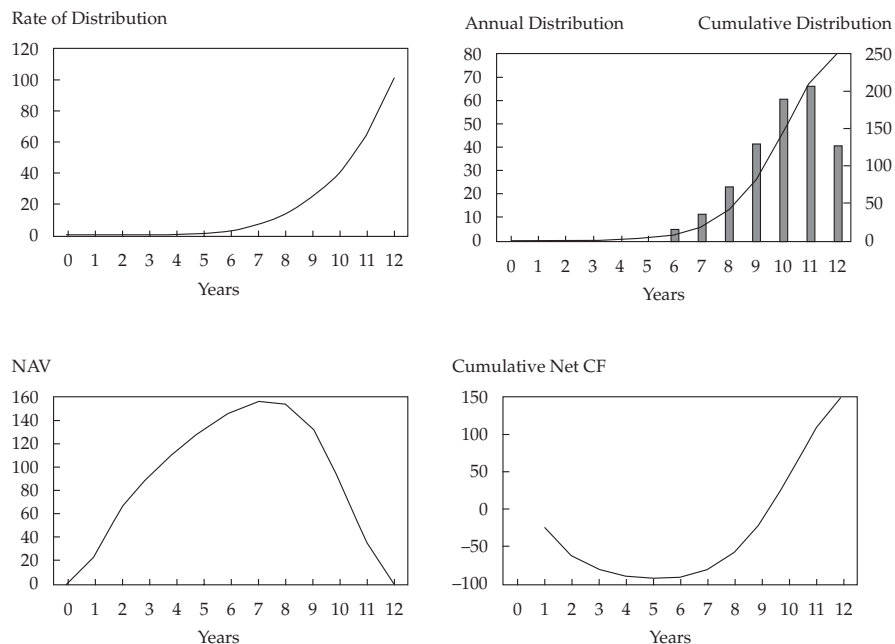
Exhibit 39 Assumed Annual Distribution Rates (RD_t)

Year	1	2	3	4	5	6	7	8	9	10	11	12
Rate of Distribution	0%	1%	3%	6%	11%	18%	26%	36%	49%	63%	80%	100%

How does the shape of the expected rate of distribution influence NAV and the annual distribution amounts? For the sake of illustration, we can change our assumption of RD such that early year distribution rates are very low and start increasing in the second half of the fund's life.²⁰ The new distribution rates are shown in Exhibit 40, and Exhibit 41 shows how distributions and the NAV would react to this change.

Exhibit 40 Alternative Assumed Annual Distribution Rates (RD_t)

Year	1	2	3	4	5	6	7	8	9	10	11	12
Rate of Distribution	0%	0%	0%	0%	1%	3%	7%	13%	24%	40%	65%	100%

Exhibit 41 Rate of Distribution, Expected Annual Distribution, NAV, and Cumulative Net Cash Flow with Back-Loaded Distributions


Although the annual capital contributions would not be affected, we can see that the lower distribution rate in the early years allows the NAV to grow higher. The cumulative net cash flow, however, would stay in the negative zone for a longer time.

²⁰ We set the "bow" (B) parameter equal to 5.0.

EXAMPLE 8**Liquidity Planning for Private Investments**

- 1 The NAV of an investor's share in a private renewable energy fund was €30 million at the end of 2020. All capital has been called. The investor expects a 20% distribution to be paid at the end of 2021. The expected growth rate is 12%. What is the expected NAV at year-end 2022?

Solution to 1:

The expected NAV at year-end 2022 is €30,105,600. The expected distribution at the end of 2021 is €6.72 million $[(€30 \text{ million} \times 1.12) \times 20\%]$. The NAV at year-end 2021 is therefore $[(€30 \text{ million} \times 1.12) - 20\%] \times 1.12\% = €30,105,600$.

A very important practical application of such models is to help determine the size of the annual commitment an investor needs to make in order to reach the target allocation of an asset class over the coming years.

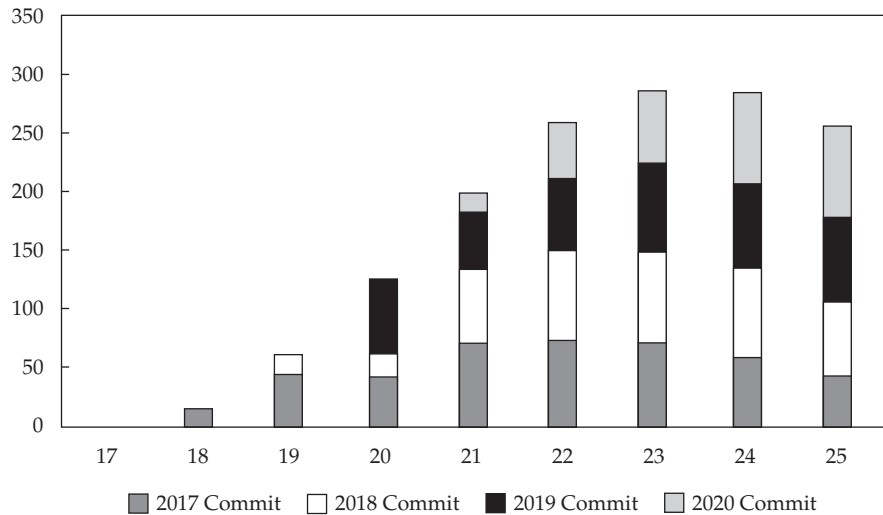
Let's assume that we manage an investment portfolio of £1 billion and that our strategic asset allocation target for private equities is 20%. We currently don't have any private equity investment in the portfolio. We also have to project the growth of the aggregate investment portfolio, because we want to achieve the 20% allocation based on the expected *future* value of the portfolio and of the private equity investment, not today's value. We assume an aggregate portfolio growth rate of 6% per year, including both net contributions and investment returns.

With these assumptions, and the private investment cash flow and NAV forecasting model discussed previously, the investor can determine the annual commitments that would be necessary to reach the overall target allocation. By using the same cash flow forecasting parameters as for the analysis in Exhibit 38, we can see that a £100 million commitment would lead the NAV to peak at around £110 million five years from now. A very rudimentary approximation could be the following: In five years, the total portfolio size would be $£1 \text{ billion} \times 1.06^5 \approx £1.338 \text{ billion}$; so, at that point, the total private equity NAV should be approximately $20\% \times £1.338 \text{ billion} = £268 \text{ million}$. Because we know that a £100 million commitment would lead to an NAV of £110 million in five years, we can extrapolate to arrive at the conclusion that a £243 million commitment today could achieve the goal.

However, this would result in a very concentrated private equity investment, with an NAV peaking in four to five years and then declining over the following years as distributions are made. A better practice is to spread commitments out over multiple years. A stable and disciplined multi-year commitment schedule leads to a more stable NAV size over time. It also achieves an important objective of diversifying exposure across vintage years. Thus, an investor can choose to commit a target amount of around £70 million per year over a period of four years (2017 through 2020) instead of concentrating his or her commitment in a single year. This schedule would bring the total private equity NAV to the target 20% level over five years. In Exhibit 42, we illustrate how the portfolio of private equity investments of different vintage years would build up over time. We also show how the total NAV would evolve beyond 2022 if no further capital commitment is made. As the chart suggests, the NAV would continue to grow through 2023 but would start to decline in later years as the 2017–2020 vintage private funds make distributions.

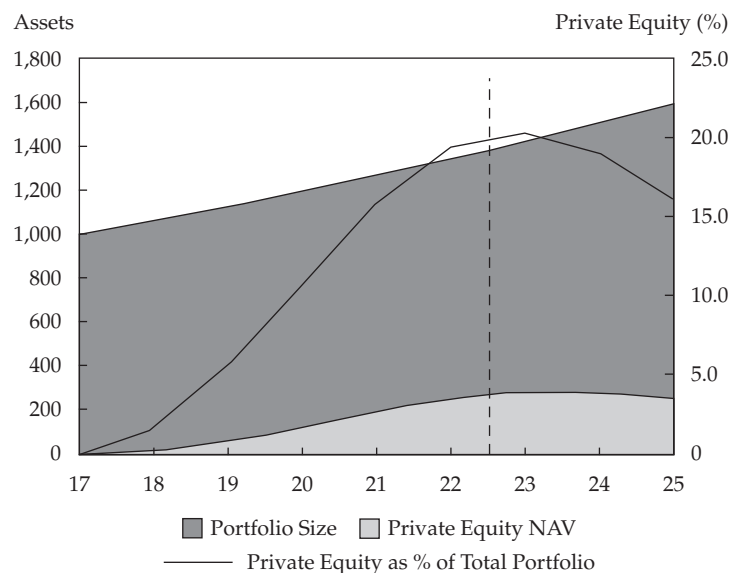
Exhibit 42 Commitment Pacing: Cumulative NAV of Private Equity Investments

Total NAV of Private Equity Program



In Exhibit 43, we show how private equity investments would grow as a proportion of the overall investment portfolio. As in the previous chart, we extend the forecast beyond 2022 so we can see that the proportion of private equity investments will start to decline if we don't make any further capital commitments after 2020.

Exhibit 43 Commitment Pacing: Private Equity NAV as % of the Total Portfolio



The investor must review her pacing model forecast periodically, updating it as needed based on the actual commitments and transactions that have occurred and refreshing the assumptions for the future. If the investor plans to maintain a 20%

allocation to private equity investments over the long run, she will clearly have to make ongoing commitments in the future, although at a slower pace once private equity is an established asset class in the portfolio.

To summarize, cash flow and pacing models enable investors to better manage their portfolio liquidity, set realistic annual commitment targets to reach the desired asset allocation, and manage portfolio beta in aggregate. Investors need to validate their model assumptions and evaluate how different parameter settings and liquidity stress scenarios could impact their investment portfolios.

8.2 Managing the Capital Calls

The investor makes an up-front commitment of a certain dollar amount to a private investment fund, and the funds will typically be called (paid in) over a period of three to four years. In many cases, the general partner (GP) will never call the full amount of the capital commitment. The limited partner (LP) is obligated to pay the capital call in accordance with the terms agreed to with the GP, often within 30 days of receiving the call notification. However, it is not practical to keep all the committed (but not yet called) capital in liquid reserves given the opportunity cost of being out of the markets during the investment phase. Investors must develop a strategy for maintaining the asset allocation while waiting for the fund to become fully invested. Capital pending investment in a private equity fund is often invested in public equities as a proxy for private equities. A similar approach may be followed in the case of other private asset classes: The investor may consider high yield as a placeholder for pending private credit investments, REITs as a placeholder for private real estate investments, and energy stocks or commodity futures as a proxy for private real asset investments.

8.3 Preparing for the Unexpected

The liquidity-planning model described here addresses the key components of cash inflows and outflows, but the model results are clearly heavily dependent on the assumptions. The model parameters can be based purely on judgment, but a better practice would be to verify estimates and forecasts with a sample of representative private funds' historical experience. Obviously, the realized cash flows in the future are likely to differ from what the model predicted based on the assumed parameters. Thus, it is advisable to run the analysis using different sets of assumptions and under different scenarios. In a bear market, GPs may call capital at a higher pace and/or make distributions at a slower pace than had been expected. This suggests that in addition to the base case scenario planning, the analyst should develop an additional set of assumptions with faster capital calls and lower distribution rates.

If the fund is scheduled to begin liquidation when the investor's public market portfolio is performing poorly (as it did in the 2007–2008 period), it is likely that the GP will exercise his option to extend the fund life. If this happens, investors may find themselves with an asset allocation significantly different from target or being unable to meet the capital calls that were intended to be funded from the distributions. These contingencies should be modeled as part of stress testing the asset allocation.

EXAMPLE 9**Private Investments, Asset Allocation, and Liquidity Planning**

The Endowment Fund of the University of Guitan (the Fund) has \$750 million in assets. The investment committee (IC) adopted the following strategic asset allocation four years ago. Private investments are at the lower end of the permitted range. To reach the target allocation among private investments, the investment team has made several new commitments recently, and they expect capital calls over the coming year equal to approximately about 20% of the current private asset net asset value.

	Strategic Asset Allocation Target	Permitted Range	Current Asset Allocation	
			(%)	(\$mil)
Cash	2%	0 to 5%	3%	22.5
Public Equities (including long/ short equity)	35%	30 to 40%	35%	262.5
Government Bonds	5%	4 to 10%	7%	52.5
High-Yield Credit	3%	2 to 5%	5%	37.5
Hedge Funds (excluding long/ short equity)	20%	17 to 23%	23%	172.5
Private Real Estate	10%	7 to 13%	8%	60.0
Private Real Assets	5%	3 to 7%	4%	30.0
Private Equity	20%	15 to 22%	15%	112.5
Total				\$750 mil
Expected Return	7.1%			
Expected Volatility	11.1%			
99% CVaR	-18.8%			
Assumed Inflation Rate	2%			

The strategic asset allocation has a 52% probability of meeting the 5% real return target (4% spend rate, 1% principal growth, and 2% inflation).

At its last meeting, the endowment committee of the board approved a temporary increase in the spending rate, raising it from 4% to 5% for the next five years to support the university's efforts to reposition itself in the face of declining enrollments. The spending rate is calculated as a percentage of the Fund's trailing 5-year average value.

The CIO (chief investment officer) has produced a capital market outlook that will guide the fund's tactical asset allocation strategy for the next several quarters. Key elements of the outlook are:

- accommodative central bank policies are ending;
- equity valuation metrics have recently set new highs;
- the economic cycle is at or near its peak (i.e., there is a meaningful probability of rising inflation and a weaker economic environment over the next several quarters); and
- returns will quite likely be lower than what has been experienced over the past five years.

She also developed the following stress scenario based on her capital market outlook:

Return Stress Scenario

Cash	2%
Public Equities (including l/s equity)	–30%
Government Bonds	–3%
High-Yield Credit	–10%
Hedge Funds (excluding l/s equity)	–8%
Private Real Estate	0%
Private Real Assets	10%
Private Equity	–10%

- 1 Identify and discuss the liquidity factors that the CIO should consider as she develops her portfolio positioning strategy for the next 12 to 24 months.
- 2 Recommend and justify a tactical asset allocation strategy for the Fund.

Solution to 1:

- Given the market outlook, it is reasonable to assume cash flows into the fund from existing private investments will be negligible.
- The fund has next-12-month liabilities as follows:
 - Approximately \$37.5 million to the university (\$750 million × 5%). This is a high (conservative) estimate based on an assumption that the trailing 5-year average Fund value is less than the current \$750 million.
 - Approximately \$40.5 million in capital calls from private investment commitments (equally allocated across private real estate, private real assets, and private equity)

$$[(\$60\text{m} + \$30\text{m} + \$112.5\text{m}) \times 20\%]$$
 - Total liabilities next 12 months = \$78 million
- Sources of immediate liquidity:
 - Cash = \$22.5 million
 - Government bonds = \$52.5 million
 - \$73.9 million in total (less than the \$78 million liability)
- Other liquidity:
 - Public equities are at the midpoint of the permitted range. The allocation could be reduced from 35% to 30% and remain within the permitted range. This would free up \$37.5 million (\$750 million × 5%) for reinvestment in more-defensive asset classes or to meet anticipated liquidity needs. However, if the return scenario is realized (equities down 30%), then the equity allocation will fall below the 30% minimum and additional rebalancing will be required.
 - High-yield credit is at the upper end of the allowed range. The allocation could be reduced from the current 5% to 2% or 3%, freeing up an additional \$15 to \$22.5 million. The limited liquidity in high-yield bond markets may make this challenging.
 - The hedge fund allocation is at the upper end of the allowed range. The allocation could be reduced from the current 23% to something in the range of 17% to 20% (between the lower end of the band and the target allocation). However, given the required redemption notice

(generally 60 to 90 days in advance of the redemption date), if the market weakens the hedge funds might invoke any gates allowed for in their documents.

- Longer term, a temporary increase in the spending rate reduces the probability that the fund will meet its real return target. This objective would be further threatened if the inflation rate does rise as the CIO fears. The liquidity profile of the Fund's investments should prepare for the possibility that, in a bad year, they may be called upon to dip into capital to fund the spending obligation.

Solution to 2:

- The Fund should target the upper end of the ranges for cash and government bonds in light of the current high equity valuations, weakening economic outlook, and threat of rising inflation. Given rising inflation and interest rate concerns, she may also consider shortening the duration of the government bond portfolio.
- The higher cash and bond allocation will also provide the liquidity buffer needed to meet the Fund's liabilities. Additional cash might be justified to fund the known payouts.
- A high allocation to real estate could also be considered a defensive positioning, but the current 8% allocation may rise toward its 13% maximum, even without additional allocations, given the expected decline in the balance of the portfolio. In addition, tactical tilts in private asset classes are difficult to implement because it would take an extended time period to make new commitments and invest the additional capital.
- The allocations to public equities and hedge funds could be reduced to fund the increases in cash and government bonds.

The following table summarizes the proposed allocation and looks at the likely end-of-year allocations if events unfold as forecast.

	Allowed Ranges		Current Allocation	Proposed Allocation		Expected Return Next 12 Months	Allocation 12 Months Forward	
	Lower Limit	Upper Limit		%	\$ (mil)		%	\$ (mil)
Cash	0%	5%	3%	10%	75	2%		0*
Public Equities	30%	40%	35%	30%	225	−30%	25%	157.50
Government Bonds	4%	10%	7%	10%	75	−3%	12%	72.75
High-Yield Credit	2%	5%	5%	5%	37.5	−10%	5%	33.75
Hedge Funds	17%	23%	23%	17%	127.5	−8%	19%	117.30
Private Real Estate	7%	13%	8%	8%	60	0%	12%	72.00
Private Real Assets	3%	7%	4%	5%	37.5	10%	8%	48.75

	Allowed Ranges		Current Allocation	Proposed Allocation		Expected Return Next 12 Months	Allocation 12 Months Forward	
	Lower Limit	Upper Limit		%	\$ (mil)		%	\$ (mil)
Private Equity	15%	22%	15%	15%	112.5	–10%	20%	123.75
Total				100%	\$750.0		100%	\$625.80

* Cash paid to fund liabilities (\$37.5 million to the university and \$40.5 million to fund private investment capital calls. Additional cash needs funded from government bond portfolio.

MONITORING THE INVESTMENT PROGRAM

9

The monitoring of an alternative investment program is time and labor intensive. Data are hard to come by and are not standardized among managers or asset classes. The analyst must spend a good amount of time gathering data and ensuring that the analysis is comparable across managers and asset classes. It is incumbent on the investor to both monitor the managers *and* the alternative investment program's progress toward the goals that were the basis for the investment in these assets.

9.1 Overall Investment Program Monitoring

When an investor makes a strategic decision to invest in alternative assets, specific goals are typically associated with the alternative investment program—return enhancement, income, risk reduction, safety, or a combination of the four. The goals may vary by asset class. A real estate program, for example, might be undertaken with the objective of replacing a portion of the fixed-income allocation—providing yield or income but also providing some measure of growth and/or inflation protection. The real estate program should be monitored relative to those goals, not simply relative to a benchmark.

We know that an alternative investment program is likely to take a number of years to reach fully-invested status. Is it reasonable to defer an assessment of the program until that point? Probably not. The investor must monitor developments in the relevant markets to ensure that the fundamental thesis underlying the decision to invest remains intact. Continuing with our real estate analogy, if real estate cap rates²¹ fall to never-before-seen lows, what are the implications for the real estate's ability to continue to fulfill its intended role in the portfolio? Or if the managers hired within the real estate allocation allocate more to commercial office properties than was anticipated, what are the implications for the ability of real estate to fulfill the income-oriented goal? Only by monitoring the development of the portfolio(s) will the investor be able to adjust course and ensure that the allocation remains on track to achieve the goals established at the outset.

We also know that investor goals and objectives are subject to change. Perhaps a university experiences a persistent decline in enrollments and the endowment fund will be called upon to provide greater support to the university while it transitions

21 The ratio of net operating income (NOI) to property asset value (the inverse of price/earnings).

to the new reality; what are the implications for a private equity program? Or what if the primary wage-earner in a two-parent household becomes critically ill; how might this affect the asset allocation? These types of events cannot be predicted, but it is important to continuously monitor the linkages between the asset allocation and the investor's goals, objectives, and circumstances. Particularly in the private markets—where changing course requires a long lead time and abruptly terminating an investment program can radically alter the risk and return profile of the portfolio—an early warning of an impending change can greatly improve the investor's ability to maintain the integrity of the investment program.

9.2 Performance Evaluation

Properly benchmarking an alternative investment strategy is a challenge that has important implications for judging the effectiveness of the alternative investment program. Many investors resort to custom index proxies (e.g., a static return premium over cash or equity index) or rely on peer group comparisons (e.g., Hedge Fund Research, Inc., Eurekahedge, Cambridge Private Equity Index). Both approaches have significant limitations.

Consider a private equity program benchmarked to the MSCI World Index plus 3%. This custom index may help frame the return expectation the investment committee holds with regard to its private equity assets, but it is unlikely to match the realized risk, return, and liquidity characteristics of the actual private equity program.

It is similarly challenging to develop a peer group representative of a manager's strategy given the high level of idiosyncratic risk inherent in most alternative investment funds. Existing providers follow vastly different rules in constructing these “benchmarks.” They all have their own set of definitions (e.g., whether a fund is a credit fund or an event-driven fund), weighting methodology (asset weighted or equal weighted), method for dealing with potential survivorship bias, and other rules for inclusion (e.g., whether the fund is currently open or closed to new capital).

Exhibit 44 shows the returns from three different hedge fund index providers. An event driven fund that generated a 6% return over the relevant 5-year period might look attractive if evaluated relative to the Credit Suisse index, whereas it might look subpar if evaluated relative to the Eurekahedge index. Additionally, a manager's ranking within the peer group is affected as much by what *other* managers do as by his own actions. Clearly, peer group ranking is, at best, one small part of the overall benchmarking exercise.

Exhibit 44 The Trouble with Peer Groups

Strategy	Provider	3-Year Annualized Return (%)	5-Year Annualized Return (%)
		ending December 31, 2017	
Equity Hedge	HFRI	5.7	6.6
	Credit Suisse	4.3	7.1
	Eurekahedge	6.5	7.8
Event-Driven	HFRI	3.8	5.9
	Credit Suisse	0.8	3.7
	Eurekahedge	6.8	7.2
Global Macro	HFRI	0.6	0.7

Exhibit 44 (Continued)

Strategy	Provider	3-Year Annualized Return (%)	5-Year Annualized Return (%)
		ending December 31, 2017	
	Credit Suisse	2.0	2.7
	Eurekahedge	−0.1	1.2

The timing and nature of reported alternative investment returns also pose challenges to monitoring the performance of alternative investment managers. For call-down strategies such as private equity, private real estate, and real assets, tracking and calculating performance might require different systems and methodologies. Private equity, credit, and real estate returns are typically reported using internal rates of return (IRRs) rather than time-weighted returns (TWR) as is common in the liquid asset classes. IRRs are sensitive to the timing of cash flows into and out of the fund. Two managers may have similar portfolios but very different return profiles depending on their particular capital call and distribution schedule. Investors have to be wise to the ways in which a manager can bias their reported IRR. Alternative metrics, such as multiple on invested capital (MOIC) have been developed to provide an additional frame of reference. (MOIC is a private equity measure that divides the current value of the underlying companies plus any distributions received by the total invested capital.)

Pricing issues also complicate performance evaluation of most alternative strategies. Stale pricing common in many alternative strategies can distort reported returns and the associated risk metrics. Betas, correlations, Sharpe ratios, and other measures must be interpreted with a healthy degree of skepticism.

Although performance measurement has its challenges with all asset classes, relying exclusively on any single measure with alternative investments increases the likelihood of inaccurate or misleading conclusions. With respect to the more illiquid investment strategies, judgment as to whether a given fund is meeting its investment objectives should be reserved until most or even all of the investments have been monetized, and capital has been returned to the investor. If capital is returned quickly (thereby possibly producing extraordinarily high IRRs), the investor may want to put greater emphasis on the MOIC measure. Similarly, funds that return capital more slowly than expected might want to put greater weight on the IRR measure. Even a fund with both a weak MOIC and a weak IRR need the measures to be put into context. An appropriate peer group analysis can help ascertain whether the “poor” performance was common across all funds of similar vintage (perhaps suggesting a poor investment climate) or whether it was specific to that fund. Likewise, a fund that posts strong performance may simply have benefited from an ideal investment period.

Perhaps the best way to gain performance insight beyond the numbers is to develop a qualitative understanding of the underlying assets. What are the manager’s expectations at the time of acquisition? How does the manager plan to add value to the investment over the holding period? What is the manager’s exit strategy for the investment? The investor can monitor how the investment develops relative to the initial thesis. This type of qualitative assessment can lead to a better understanding of whether the manager did well for the right reasons, whether the manager was wrong but for the right reasons, or whether the manager was just wrong.

9.3 Monitoring the Firm and the Investment Process

In addition to monitoring the portfolio, monitoring of the investment process and the investment management firm itself are particularly important in alternative investment structures where the manager cannot be terminated easily, and the assets transferred to another manager in which the investor has more confidence. What follows is a non-exhaustive list of issues that the investor will want to monitor:

- *Key person risk:* Most alternative investment strategies depend to a large extent on the skill of a few key investment professionals. These are what are known as “key persons.” Key persons are typically specified in the fund documents, with certain rights allocated to the limited partners in the event a key person leaves the firm. It is important to ensure that these investment professionals remain actively involved in the investment process. There are also other employees of the investment manager whose departure may negatively affect the operation of the business or signal an underlying problem. If, for example, the chief operating officer or chief compliance officer leaves the firm, it is important to understand why and what effect it may have on the business.
- *Alignment of interests:* Alignment of interest issues range from the complexity of the organization, structure of management fees, compensation of the investment professionals, growth in assets under management (AUM), and the amount of capital the key professionals have committed to the funds that they are managing. The investor will want to verify that the money manager’s interests remain closely aligned with their own. Has the manager withdrawn a significant portion of her own capital that had been invested alongside the limited partners? If so, why? Is the manager raising a new fund? If so, what safeguards are in place to ensure that the investment professionals are not unduly distracted with fundraising, firm administration, or unfairly concentrated on managing other funds? Is the opportunity set deep enough to support the additional capital being raised? Will the funds have shared ownership interest in a given asset? If so, what conflicts of interest may arise (e.g., the manager may earn an incentive fee in one fund if the asset is sold, while it may be in the best interest of the second fund to sell the asset at a later date).
- *Style drift:* Fund documents often give managers wide latitude as to their investment options and parameters, but it is incumbent on the investor to understand where the fund manager has a competitive advantage and skill and confirm that the investments being made are consistent with the manager’s edge.
- *Risk management:* The investor should understand the manager’s risk management philosophy and processes and periodically confirm that the fund is abiding by them. Where a fund makes extensive use of leverage, a robust risk management framework is essential.
- *Client/asset turnover:* A critical part of the ongoing due diligence process should include a review of clients and assets. A significant gain or drop in either may be a sign of an underlying problem. An unusual gain in assets could make it difficult for the investment professionals to invest in suitably attractive investments, potentially handicapping future performance. Conversely, significant client redemptions may force the money manager to sell attractive assets as he looks to raise cash. If this occurs during periods of market turmoil when liquidity in the market itself may be low, the manager may be forced to sell what he can rather than what he should in order to optimize performance. This could hurt the returns of non-redeeming clients and/or leave the remaining clients with illiquid holdings that might make it difficult for them to redeem in the future.

- *Client profile:* Investors will want to gauge the profile of the fund manager's other clients. Are the fund's other clients considered long-term investors, or do they have a history of redeeming at the first sign of trouble? Are they new to the alternative investment space and perhaps don't understand the nuances of the fund's strategy and risks? You may have a strong conviction in a money manager's skills, but the actions of others may affect your ability to reap the benefits of those skills. If too many of her other clients elect to redeem, the manager may invoke the gates allowed by the fund's documents or, at the extreme, liquidate the fund at what might be the worst possible moment. This was a common occurrence during 2008–2009, when investors sought to raise cash by redeeming from their more liquid fund managers. Even if a money manager weathers massive outflows, profitability and the ability to retain key talent may be at risk.
- *Service providers:* Investors will want to ensure that the fund manager has engaged independent and reputable third-party service providers, including administrators, custodians, and auditors. Although an investor may have performed extensive checks prior to investing, it is good practice to periodically verify that these relationships are intact and working well. If the service provider changes, the investor will want to understand *why*. Has the fund's AUM grown to a level that cannot be handled adequately by the current provider? Perhaps the service provider has chosen to terminate the relationship because of actions taken by the fund manager. Exploring the motivation behind a change in a service provider can uncover early warning flags deserving of further investigation.

EXAMPLE 10

Monitoring Alternative Investment Programs

- 1 The O'Hara family office determined that the illiquidity risk inherent in private investments is a risk that the family is ill-suited to bear. As a result, they decided several years ago to unwind their private equity program. There are still a few remaining assets in the portfolio. The CIO (chief investment officer) notices that the private equity portfolio has delivered outstanding performance lately, especially relative to other asset classes. He presents the data to his research staff and wants to revisit their decision to stop making new private equity investments. Explain why the investment results that prompted the CIO's comments should not be relied upon.
- 2 The ZeeZaw family office has been invested in the Warriors Fund, a relatively small distressed debt strategy, which has performed very well for a number of years. In a recent conversation with the portfolio manager, the CIO for ZeeZaw discovered that the Warriors fund will be receiving a significant investment from a large institution within the next few weeks. What are some of the risks that might develop with the Warriors Fund as a result of this new client? What are some other issues that the CIO might want to probe with the Warriors Fund?

Solution to 1:

With small, residual holdings, even a modest change in valuation can result in outsized returns; for example, a \$2,000 investment that gets revalued to \$3,000 would report a nominal return of 50%. The 50% return is not representative of private equity investment as a whole but is merely an artifact of the unwinding

process. A more accurate picture of performance must consider the development of the fund IRR over time and consider other performance measures, such as the MOIC.

Solution to 2:

The CIO should investigate whether the fund manager is able to appropriately deploy this new capital consistent with the investment process and types of investments that contributed to the Warriors Fund success. Because the fund was relatively small, a very large influx of capital might force the portfolio manager to make larger investments than is optimal or more investments than they did before. Either change without the appropriate resources could undermine future success. Finally, a large influx of cash could dilute near-term performance, especially if the funds remain undeployed for a significant period of time.

SUMMARY

- Allocations to alternatives are believed to increase a portfolio's risk-adjusted return. An investment in alternatives typically fulfills one or more of four roles in an investor's portfolio: capital growth, income generation, risk diversification, and/or safety.
- Private equity investments are generally viewed as return enhancers in a portfolio of traditional assets.
- Long/short equity strategies are generally believed to deliver equity-like returns with less than full exposure to the equity premium. Short-biased equity strategies are expected to lower a portfolio's overall equity beta while producing some measure of alpha. Arbitrage and event-driven strategies are expected to provide equity-like returns with little to no correlation with traditional asset classes.
- Real assets (e.g., commodities, farmland, timber, energy, and infrastructure assets) are generally perceived to provide a hedge against inflation.
- Timber investments provide both growth and inflation-hedging properties.
- Commodities (e.g., metals, energy, livestock, and agricultural commodities) serve as a hedge against inflation and provide a differentiated source of alpha. Certain commodity investments serve as safe havens in times of crisis.
- Farmland investing may have a commodity-like profile or a commercial real-estate-like profile.
- Energy investments are generally considered a real asset as the investor owns the mineral rights to commodities that are correlated with inflation factors.
- Infrastructure investments tend to generate stable/modestly growing income and to have high correlation with overall inflation.
- Real estate strategies range from core to opportunistic and are believed to provide protection against unanticipated increases in inflation. Core real estate strategies are more income-oriented, while opportunistic strategies rely more heavily on capital appreciation.
- Bonds have been a more effective volatility mitigator than alternatives over shorter time horizons.

- The traditional approaches to defining asset classes are easy to communicate and implement. However, they tend to over-estimate portfolio diversification and obscure primary drivers of risk.
- Typical risk factors applied to alternative investments include equity, size, value, liquidity, duration, inflation, credit spread, and currency. A benefit of the risk factor approach is that every asset class can be described using the same framework.
- Risk factor-based approaches have certain limitations. A framework with too many factors is difficult to administer and interpret, but too small a set of risk factors may not accurately describe the characteristics of alternative asset classes. Risk factor sensitivities are highly sensitive to the historical look-back period.
- Investors with less than a 15-year investment horizon should generally avoid investments in private real estate, private real asset, and private equity funds.
- Investors must consider whether they have the necessary skills, expertise, and resources to build an alternative investment program internally. Investors without a strong governance program are less likely to develop a successful alternative investment program.
- Reporting for alternative funds is often less transparent than investors are accustomed to seeing on their stock and bond portfolios. For many illiquid strategies, reporting is often received well past typical monthly or quarter-end deadlines. Full, position-level transparency is rare in many alternative strategies.
- Three primary approaches are used to determine the desired allocation to the alternative asset classes:
 - Monte Carlo simulation may be used to generate return scenarios that relax the assumption of normally distributed returns.
 - Optimization techniques, which incorporate downside risk or take into account skew, may be used to enhance the asset allocation process.
 - Risk factor-based approaches to alternative asset allocation can be applied to develop more robust asset allocation proposals.
- Two key analytical challenges in modelling allocations to alternatives include stale and/or artificially smoothed returns and return distributions that exhibit significant skewness and fat tails (or excess kurtosis).
- Artificially smoothed returns can be detected by testing the return stream for serial correlation. The analyst needs to unsmooth the returns to get a more accurate representation of the risk and return characteristics of the asset class.
- Skewness and kurtosis can be dealt with by using empirically observed asset returns because they incorporate the actual distribution. Advanced mathematical or statistical models can also be used to capture the true behavior of alternative asset classes.
- Applications of Monte Carlo simulation in allocating to alternative investments include:
 - 1 simulating skewed and fat-tailed financial variables by estimating the behavior of factors and/or assets in low-volatility regimes and high-volatility regimes, then generating scenarios using the different means and covariances estimated under the different regimes; and
 - 2 simulating portfolio outcomes (+/- 1 standard deviation) to estimate the likelihood of falling short of the investment objectives.

- Unconstrained mean–variance optimization (MVO) often leads to portfolios dominated by cash and fixed income at the low-risk end of the spectrum and by private equity at the high-risk end of the spectrum. Some investors impose minimum and maximum constraints on asset classes. Slight changes in the input variables could lead to substantial changes in the asset allocations.
- Mean–CVaR optimization may be used to identify allocations that minimize downside risk rather than simply volatility.
- Investors may choose to optimize allocations to risk factors rather than asset classes. These allocations, however, must be implemented using asset classes. Portfolios with similar risk factor exposures can have vastly different asset allocations.
- Some caveats with respect to risk factor-based allocations are that investors may hold different definitions for a given risk factor; correlations among risk factors may shift under changing market conditions, and some factor sensitivities are very unstable.
- Cash flow and commitment-pacing models enable investors in private alternatives to better manage their portfolio liquidity and set realistic annual commitment targets to reach the desired asset allocation.
- An alternative investment program should be monitored relative to the goals established for the alternative investment program, not simply relative to a benchmark. The investor must monitor developments in the relevant markets to ensure that the fundamental thesis underlying the decision to invest remains intact.
- Two common benchmarking approaches to benchmarking alternative investments—custom index proxies and peer group comparisons—have significant limitations.
- IRRs are sensitive to the timing of cash flows into and out of the fund: Two managers may have similar portfolios but different return profiles depending on their capital call and distribution schedule.
- Pricing issues can distort reported returns and the associated risk metrics, such as betas, correlations, and Sharpe ratios.
- Monitoring of the firm and the investment process are particularly important in alternative investment structures where the manager cannot be terminated easily. Key elements to monitor include key person risk, alignment of interests, style drift, risk management, client/asset turnover, client profile, and service providers.

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PRACTICE PROBLEMS

The following information relates to Questions 1–8

Kevin Kroll is the chair of the investment committee responsible for the governance of the Shire Manufacturing Corporation (SMC) defined benefit pension plan. The pension fund is currently fully funded and has followed an asset mix of 60% public equities and 40% bonds since Kroll has been chair. Kroll meets with Mary Park, an actuarial and pension consultant, to discuss issues raised at the last committee meeting.

Kroll notes that the investment committee would like to explore the benefits of adding alternative investments to the pension plan's strategic asset allocation. Kroll states:

Statement 1 The committee would like to know which alternative asset would best mitigate the risks to the portfolio due to unexpected inflation and also have a relatively low correlation with public equities to provide diversification benefits.

The SMC pension plan has been able to fund the annual pension payments without any corporate contributions for a number of years. The committee is interested in potential changes to the asset mix that could increase the probability of achieving the long-term investment target return of 5.5% while maintaining the funded status of the plan. Park notes that fixed-income yields are expected to remain low for the foreseeable future. Kroll asks:

Statement 2 If the public equity allocation remains at 60%, is there a single asset class that could be used for the balance of the portfolio to achieve the greatest probability of maintaining the pension funding status over a long time horizon? Under this hypothetical scenario, the balance of the portfolio can be allocated to either bonds, hedge funds, or private equities.

Park confirms with Kroll that the committee has historically used a traditional approach to define the opportunity set based on distinct macroeconomic regimes, and she proposes that a risk-based approach might be a better method. Although the traditional approach is relatively powerful for its ability to handle liquidity and manager selection issues compared to a risk-based approach, they both acknowledge that a number of limitations are associated with the existing approach.

Park presents a report (Exhibit 1) that proposes a new strategic asset allocation for the pension plan. Kroll states that one of the concerns that the investment committee will have regarding the new allocation is that the pension fund needs to be able to fund an upcoming early retirement incentive program (ERIP) that SMC will be offering to its employees within the next two years. Employees who have reached the age of 55 and whose age added to the number of years of company service sum to 75 or more can retire 10 years early and receive the defined benefit pension normally payable at age 65.

Exhibit 1 Proposed Asset Allocation of SMC Defined Benefit Pension Plan

Asset Class	Public Equities	Broad Fixed Income	Private Equities	Hedge Funds	Public Real Estate	Total
Target	45%	25%	10%	10%	10%	100%
Range	35%–55%	15%–35%	0%–12%	0%–12%	0%–12%	–

Kroll and Park then discuss suitability considerations related to the allocation in Exhibit 1. Kroll understands that one of the drawbacks of including the proposed alternative asset classes is that daily reporting will no longer be available. Investment reports for alternatives will likely be received after monthly or quarter-end deadlines used for the plan's traditional investments. Park emphasizes that in a typical private equity structure, the pension fund makes a commitment of capital to a blind pool as part of the private investment partnership.

In order to explain the new strategic asset allocation to the investment committee, Kroll asks Park why a risk factor-based approach should be used rather than a mean–variance-optimization technique. Park makes the following statements:

Statement 3 Risk factor-based approaches to asset allocation produce more robust asset allocation proposals.

Statement 4 A mean–variance optimization typically overallocates to the private alternative asset classes due to stale pricing.

Park notes that the current macroeconomic environment could lead to a bear market within a few years. Kroll asks Park to discuss the potential impact on liquidity planning associated with the actions of the fund's general partners in the forecasted environment.

Kroll concludes the meeting by reviewing the information in Exhibit 2 pertaining to three potential private equity funds analyzed by Park. Park discloses the following due diligence findings from a recent manager search: Fund A retains administrators, custodians, and auditors with impeccable reputations; Fund B has achieved its performance in a manner that appears to conflict with its reported investment philosophy; and Fund C has recently experienced the loss of three key persons.

Exhibit 2 Potential Private Equity Funds, Internal Rate of Return (IRR)

Private Equity Fund	Fund A	Fund B	Fund C
5-year IRR	12.9%	13.2%	13.1%

- Based on Statement 1, Park should recommend:
 - hedge funds.
 - private equities.
 - commodity futures.
- In answering the question raised in Statement 2, Park would *most likely* recommend:
 - bonds.
 - hedge funds.

- C** private equities.
 - 3** A limitation of the existing approach used by the committee to define the opportunity set is that it:
 - A** is difficult to communicate.
 - B** overestimates the portfolio diversification.
 - C** is sensitive to the historical look-back period.
 - 4** Based on Exhibit 1 and the proposed asset allocation, the greatest risk associated with the ERIP is:
 - A** liability.
 - B** leverage.
 - C** liquidity.
 - 5** The suitability concern discussed by Kroll and Park *most likely* deals with:
 - A** governance.
 - B** transparency.
 - C** investment horizon.
 - 6** Which of Park's statements regarding the asset allocation approaches is correct?
 - A** Only Statement 3
 - B** Only Statement 4
 - C** Both Statement 3 and Statement 4
 - 7** Based on the forecasted environment, liquidity planning should take into account that general partners may:
 - A** call capital at a slower pace.
 - B** make distributions at a faster pace.
 - C** exercise an option to extend the life of the fund.
 - 8** Based on Exhibit 2 and Park's due diligence, the pension committee should consider investing in:
 - A** Fund A.
 - B** Fund B.
 - C** Fund C.
-

SOLUTIONS

- 1 C is correct. Real assets (which include energy, infrastructure, timber, commodities, and farmland) are generally believed to mitigate the risks to the portfolio arising from unexpected inflation. Commodities act as a hedge against a core constituent of inflation measures. Rather than investing directly in the actual commodities, commodity futures may be incorporated using a managed futures strategy. In addition, the committee is looking for an asset class that has a low correlation with public equities, which will provide diversification benefits. Commodities are regarded as having much lower correlation coefficients with public equities than with private equities and hedge funds. Therefore, commodities will provide the greatest potential to fulfill the indicated role and to diversify public equities.
- 2 C is correct. When projecting expected returns, the order of returns from highest to lowest is typically regarded as private equities, hedge funds, bonds. Therefore, the probability of achieving the highest portfolio return while maintaining the funded status of the plan would require the use of private equities in conjunction with public equities. In addition, private equities have a high/strong potential to fulfill the role of capital growth. Fixed-income investments are expected to have a high/strong potential to fulfill the role of safety.
- 3 B is correct. A traditional approach has been used to define the opportunity set based on different macroeconomic conditions. The primary limitations of traditional approaches are that they overestimate the portfolio diversification and obscure the primary drivers of risk.
- 4 C is correct. With the introduction of the early retirement incentive plan (ERIP), the defined benefit pension plan will likely be called upon to make pension payments earlier than originally scheduled. As a result, the near term liquidity of the plan is the greatest risk arising from the addition of the alternative asset classes (e.g., private equities, hedge funds, and real estate). Investments in alternatives, such as private equities, can take upwards of five years to reach a full commitment and potentially another decade to unwind.
- 5 B is correct. The pension plan's investment in private equities via a blind pool presents the prospect that less than perfect transparency will be associated with the underlying holdings of the alternative asset manager. Capital is committed for an investment in a portfolio of assets that are not specified in advance. In addition, reporting for alternative funds is often less transparent than investors are accustomed to seeing on their stock and bond portfolios.
- 6 C is correct. Statement 3 is correct because risk factor-based approaches to asset allocation can be applied to develop more robust asset allocations. Statement 4 is correct because a mean–variance optimization typically over-allocates to the private alternative asset classes, partly because of underestimated risk due to stale pricing and the assumption that returns are normally distributed.
- 7 C is correct. Park notes that the current macroeconomic environment could lead to a bear market within a few years. Liquidity planning should take into account that under a scenario in which public equities and fixed-income investments are expected to perform poorly, general partners may exercise an option to extend the life of the fund.
- 8 A is correct. Fund A should be selected based on both quantitative and qualitative factors. Fund A has a five-year IRR (12.9%) that is slightly lower than, but comparable to, both Fund B (13.2%) and Fund C (13.1%). Given the sensitivity

to the timing of cash flows into and out of a fund associated with the IRR calculation, however, the final decision should not be based merely on quantitative returns. It is also important to monitor the investment process and the investment management firm itself, particularly in alternative investment structures. Considering the qualitative factors identified by Park, Fund A is the only fund with a strong, positive factor: It benefits from service providers (administrators, custodians, and auditors) with impeccable reputations. Fund B seems to be experiencing style drift, which suggests that the returns are not consistent with the manager's advertised investment edge (hence, a negative factor). Fund C has experienced the departure of key persons, which puts future fund returns in jeopardy (hence, a negative factor).

PORTFOLIO MANAGEMENT STUDY SESSION

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Private Wealth Management (1)

This study session addresses the process of private wealth management and the construction of an investment policy statement (IPS) for the individual investor. The IPS is a blueprint for investing client assets. The IPS identifies the needs, goals, and risk tolerance of the investor, as well as constraints under which the investment portfolio must operate. The adviser then formulates an investment strategy to tax-efficiently reconcile these potentially conflicting requirements.

Taxes and regulations are important considerations for individual investors. Because taxes and regulations vary from locality to locality, tax-efficient strategies for portfolio construction and wealth transfer are necessarily specific to the locality in which the investor is taxed. The study session focuses on investment strategies applicable across a wide range of localities. Although illustrations of such strategies may be presented from a country-specific perspective, candidates should focus on the underlying investment principles and be able to apply them to other tax settings.

READING ASSIGNMENTS

Reading 28	Overview of Private Wealth Management by Christopher J. Sidoni, CFP, CFA, and Vineet Vohra, CFA
Reading 29	Taxes and Private Wealth Management in a Global Context by Stephen M. Horan, PhD, CFA, CIPM, and Thomas R. Robinson, PhD, CFA
Reading 30	Estate Planning in a Global Context by Stephen M. Horan, PhD, CFA, CIPM, and Thomas R. Robinson, PhD, CFA

READING

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Overview of Private Wealth Management

by Christopher J. Sidoni, CFP, CFA, and Vineet Vohra, CFA

Christopher J. Sidoni, CFP, CFA, is at Gibson Capital, LLC (USA). Vineet Vohra, CFA, is at Cognasia Talent (Singapore and Hong Kong SAR).

LEARNING OUTCOMES

<i>Mastery</i>	<i>The candidate should be able to:</i>
<input type="checkbox"/>	a. contrast private client and institutional client investment concerns;
<input type="checkbox"/>	b. discuss information needed in advising private clients;
<input type="checkbox"/>	c. identify tax considerations affecting a private client's investments;
<input type="checkbox"/>	d. identify and formulate client goals based on client information;
<input type="checkbox"/>	e. evaluate a private client's risk tolerance;
<input type="checkbox"/>	f. describe technical and soft skills needed in advising private clients;
<input type="checkbox"/>	g. evaluate capital sufficiency in relation to client goals;
<input type="checkbox"/>	h. discuss the principles of retirement planning;
<input type="checkbox"/>	i. discuss the parts of an investment policy statement (IPS) for a private client;
<input type="checkbox"/>	j. prepare the investment objectives section of an IPS for a private client;
<input type="checkbox"/>	k. evaluate and recommend improvements to an IPS for a private client;
<input type="checkbox"/>	l. recommend and justify portfolio allocations and investments for a private client;
<input type="checkbox"/>	m. describe effective practices in portfolio reporting and review;
<input type="checkbox"/>	n. evaluate the success of an investment program for a private client;
<input type="checkbox"/>	o. discuss ethical and compliance considerations in advising private clients;
<input type="checkbox"/>	p. discuss how levels of service and range of solutions are related to different private clients.

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INTRODUCTION

Private wealth management refers to investment management and financial planning for individual investors. The private wealth sector has grown considerably as global wealth has increased and as individuals have taken on more of the responsibility for managing their own financial resources. Private wealth managers can help individual investors seek the benefits as well as navigate the complexities of financial markets.

This reading introduces candidates to the process of designing and executing an investment plan or strategy for the individual investor. We discuss the tools and techniques used by private wealth managers and how the wealth manager interacts with the client to serve the client's needs. Section 2 examines the key differences between private clients and institutional clients. In Section 3, we discuss how the wealth manager gains an understanding of the client and identifies key attributes of the client's financial situation that are relevant to the wealth management process. Section 4 covers investment planning, including capital sufficiency and retirement planning. Section 5 discusses the investment policy statement, including its various underlying parts. Section 6 analyzes portfolio construction, portfolio reporting, and portfolio review. Finally, in Section 7, we discuss the practice of private wealth management, including ethical considerations for private wealth managers, compliance considerations, and the various client segments that private wealth managers encounter.

Reflecting the variation in industry terms, we use the terms "private wealth managers," "wealth managers," and "advisors" interchangeably.¹ We also refer to "individual investors" as "private clients" or, simply, "clients." In practice, private wealth managers typically operate either independently or as representatives of organizations, such as wealth management firms, banks, and broker/dealers.

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PRIVATE CLIENTS VERSUS INSTITUTIONAL CLIENTS

Private clients include individuals and families seeking to invest their personal wealth. These clients are asset owners but typically retain private wealth managers to undertake investment responsibilities on their behalf. Private clients and institutional clients have different concerns, including the following:

- *Investment objectives.*² Private clients have diverse investment objectives, some of which may be broadly defined. By contrast, institutional investors tend to have specific, clearly defined investment objectives.
- *Constraints.* Private clients face constraints that differ from those of institutional clients, such as generally shorter time horizons, smaller portfolio sizes (less scale), and more significant tax considerations.
- *Other distinctions.* Institutional investors operate under a formal governance structure and often have a greater level of investment sophistication than many private clients. Behavioral issues may also be more prominent for private clients. In addition, while regulation is common to both private clients and institutional clients, the regulatory bodies and frameworks may differ.

¹ It should also be noted that among client segments with high levels of wealth, the roles of wealth managers may vary.

² In practice, the terms "objectives" and "goals" are often used interchangeably. We also use them interchangeably in this reading.

2.1 Investment Objectives

Private clients have several potential investment objectives. Some common objectives include financial security during the client's retirement years, the ability to provide financial support to family members, and the funding of philanthropic goals. These objectives, however, may not be clearly defined or quantified. For example, a private client's goal may be to fund her retirement lifestyle, but she may not be able to quantify the annual cash flow requirement. She may be able to estimate what is required at the beginning of retirement but uncertain about how the required amount may fluctuate throughout retirement. A different client may wish to fund higher education expenses for his young children. However, he may not know how many of his children will attend a college or university, or what tuition and expenses will be.

Private client investment objectives often compete with one another and may change over time. Consider a business owner who wishes to fund a comfortable retirement for himself and also give generously to certain charities. An unexpected change in his business may shift his priorities considerably. For example, a business downturn may cause him to reduce his charitable goals or eliminate them completely. Conversely, a significant liquidity event, such as the sale of his business, may make a comfortable retirement virtually certain, causing the client to increase his charitable aspirations.

In contrast to private clients, institutional clients tend to have more clearly defined objectives, which are typically related to a specific liability stream. For example, the investment program of a pension plan is designed to meet its benefit obligation, while a university endowment allocates investments to achieve its spending policy. Unlike the objectives of private clients, the primary objectives of these institutional investors are unlikely to change materially over time.

2.2 Constraints

Private clients have unique constraints, resulting in investment strategies and approaches that are different from those of institutional clients. Such constraints include time horizon, scale, and taxes.

2.2.1 Time horizon

In general, individual investors have a shorter time horizon than institutional investors, whose horizon is often theoretically infinite. With shorter time horizons, individual investors are typically more constrained than institutions with respect to risk taking and liquidity. Time horizons also depend on an investor's objectives. For example, individual investors may have different time horizons for different objectives, while institutional investors tend to have a single time horizon and a single investment objective.

2.2.2 Scale

In general, individual investor portfolios tend to be smaller in size (or scale) than those of institutional investors. Because of this smaller portfolio size, many individual investors face limitations relating to certain asset classes, such as private equity and private real estate, which require a significant investment and would result in an imbalanced portfolio. As with time horizon, the size of private client portfolios can vary widely.

2.2.3 Taxes

Taxes are a significant and complex consideration for many individual investors, and they vary by jurisdiction. The presence of taxes on investment income or on realized capital gains can impact such investment decisions as asset allocation and manager selection. Investment strategies that result in considerable taxable income may be

more favored by a tax-exempt institution than by a taxable private client. Similarly, tax-efficient investments may be more attractive to taxable private clients. An example of a tax-efficient investment is a low-turnover common stock portfolio.

2.3 Other Distinctions

In addition to investment objectives and constraints, there are other key distinctions between private clients and institutional clients. Private clients have a less formal governance structure, are typically less sophisticated at investing, may operate under a different regulatory regime, and are more individually unique and complex. Because of these aspects, the personality profile, time allocation, and resource needs/constraints of a private wealth manager differ significantly from those of an institutional manager.

2.3.1 *Investment Governance*

The investment governance model and the decision-making process for individual investors differ considerably from those of institutional investors. Institutional investors typically operate under a formal governance structure. This governance structure generally includes a board of directors and an investment committee, sometimes augmented by independent directors with investment expertise. The investment committee may consist of a subset of the board of directors, or the board may delegate this responsibility to an internal committee of staff members. The board and the investment committee play a key role in setting the investment strategy and monitoring investment performance.

By contrast, investment governance for individual investors tends to be less formal. The individual investor works with a private wealth manager to determine an appropriate investment policy. The investment policy is often described in an investment policy statement (which is discussed later in this reading) and typically grants implementation and reporting responsibilities to the wealth manager.

2.3.2 *Investment Sophistication*

Institutional investors tend to have a higher degree of investment sophistication than the typical private investor as well as access to more investment resources. Unlike institutional clients, private clients do not normally benefit from the “checks and balances” of a formal investment governance framework. As a result, private clients can be more vulnerable to making “emotional” investment decisions.

2.3.3 *Regulation*

In most countries, the regulatory environment is different for individual and institutional investors. In some cases, separate regulators focus on these two investor segments. For example, in the United States, the Securities and Exchange Commission (SEC) and state regulators oversee independent registered investment advisors (RIAs), while the Financial Industry Regulatory Authority (FINRA) covers those advisors who work for broker/dealer organizations. In other cases, the individual and institutional investor groups share a common regulator but are subject to different regulations. An example of this structure occurs in Singapore, where the Monetary Authority of Singapore (MAS) is the primary regulator of financial institutions, yet the MAS also regulates individual investors through its Financial Advisors Act (FAA). This shared regulatory structure also exists in several other countries, such as Australia, China, India, Indonesia, and Malaysia.

2.3.4 Uniqueness and Complexity

One final difference between private and institutional clients relates to the uniqueness and complexity of individuals. Private clients with similar sets of financial considerations and objectives may nevertheless pursue different investment strategies. Multiple factors may influence each individual's preferences, needs, and concerns—notably, family background and upbringing, work history, sources of wealth, investment experience, groups of friends, and geographic location. Institutional clients with similar considerations and objectives may also follow different investment strategies, but this outcome is less likely with institutional clients than with private clients.

EXAMPLE 1

Private versus Institutional Clients

Garrett Jones, age 74, is a member of the investment committee for a local non-profit endowment. The endowment portfolio includes sizable allocations to less liquid and more volatile asset classes, such as hedge funds and private equity. Jones's personal portfolio, which is modest in size, contains no exposure to hedge funds or private equity. Jones asks his wealth manager about the lack of exposure to these asset classes.

Discuss why the wealth manager has likely not recommended investments in hedge funds and private equity to Jones.

Solution:

Jones's wealth manager has likely not recommended these investments because of certain private client constraints. First, as an individual investor, Jones likely has a shorter time horizon and/or greater liquidity needs than an institutional investor (such as the endowment for which Jones is a committee member). Second, the relatively small size of Jones's personal portfolio will most likely preclude investing in certain asset classes, such as hedge funds and private equity, which require a significant investment and would result in an imbalanced portfolio. Finally, Jones's personal tax considerations may make these investments relatively unattractive.

UNDERSTANDING PRIVATE CLIENTS

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Every new private client engagement begins with developing an understanding of the client. In this section, we begin with a discussion of the information needed in advising private clients and how wealth managers obtain this information. In addition, we discuss a process for formulating client goals, the evaluation of a private client's risk tolerance, and both the technical and "soft" skills needed to advise private clients.

3.1 Information Needed in Advising Private Clients

Wealth managers gather client information predominantly through conversations with clients and by reviewing various financial documents. In this section, we cover the relevant personal, financial, and other information needed in advising private clients.

3.1.1 Personal Information

The process of gathering personal information begins when the wealth manager first communicates with the individual investor. In introductory meetings or telephone calls, individuals typically learn about how wealth managers work with clients, the types of clients that they advise, their areas of expertise, and their fees for service. At the same time, wealth managers ask questions to learn more about prospective clients and what is important to them. While the main purpose of this first interaction is to determine mutual “fit,” the introductory conversation often also provides valuable portfolio management information to both sides.

Once an individual becomes a private client, the wealth manager starts by learning about the client’s family situation, including marital status, the number of children and grandchildren, and the ages of family members. In most jurisdictions, obtaining proof of client identification is required. For example, a copy of a passport may need to be obtained. The client’s employment and career information is also important, as is a discussion about the client’s future career, business, or retirement aspirations. In addition, wealth managers should assess the sources of a client’s wealth. This information is not always evident from investment statements or reports. For example, a client who has gradually built her wealth through regular portfolio contributions over many years likely has significant experience with market volatility. She also may be able to articulate her emotional reactions (or lack thereof) to various market events. A different client who has relatively new wealth due to the sale of a business may not have this same experience or ability.

As part of the investment background conversation, the wealth manager should determine whether the client has an explicit return objective. Some clients have clear expectations for minimum absolute or relative return targets. Other clients are more concerned with meeting specific goals and may not have a particular return objective. Information about a client’s investment preferences may also be generated through conversation with the wealth manager. For instance, liquidity preferences or a desire to consider environmental, social, and governance (ESG) issues in investments may surface in early conversations.

Finally, a detailed discussion of the client’s financial objectives (often also referred to as “goals”) and risk tolerance is part of the personal information gathering process. We discuss goals, objectives, and risk tolerance in more detail later in this reading.

3.1.2 Financial Information

It is important for wealth managers to understand the financial information of a private client. In many cases, private clients do not maintain and regularly update personal financial statements, such as a *personal balance sheet* (also known as a net worth statement) or a statement of cash flows. Therefore, one responsibility of the wealth manager is to piece together these financial statements for the client.

On a private client’s personal balance sheet, assets typically include the following:

- Cash and deposit accounts
- Brokerage accounts
- Retirement accounts (e.g., employer-sponsored defined contribution plan accounts or the present value of defined benefit pensions)
- Other employee benefits, such as restricted stock or stock options
- Ownership interests (stock) in private businesses
- Cash-value life insurance³

³ A cash-value life insurance policy involves a cash reserve in addition to protection for the death of an individual. This form of insurance usually combines life insurance with some type of cash accumulation vehicle.

- Real property, including residences, rental property, and land
- Other personal assets (e.g., automobiles, art, or jewelry)

Liabilities on a private client's balance sheet typically include the following:

- Consumer debt, such as credit card balances and loans outstanding
- Automobile loans
- Student loans
- Property-related loans, such as mortgages and home equity loans (or lines of credit)
- Margin debt in brokerage accounts

Clients provide information about their assets and liabilities to wealth managers through copies of statements and reports. A key challenge for wealth managers is that the information provided by clients may not be comprehensive. To fully understand a client's financial profile, a wealth manager needs to analyze and synthesize these statements and reports. Exhibit 1 shows a sample personal balance sheet for a fictitious married couple, Steven and Jenny MacAuley.

Exhibit 1 Sample Personal Balance Sheet

ASSETS		LIABILITIES	
Cash and Deposit Accounts		Consumer Debt	
Bank deposit account	EUR 40,000	Credit cards	EUR 30,000
Brokerage and Retirements Accounts		Property-Related Loans	
Individual account for Steven	EUR 850,000	Mortgage for personal residence	EUR 320,000
Individual account for Jenny	EUR 1,200,000	Mortgage for rental property 1	EUR 110,000
Retirement account for Steven	EUR 1,400,000	Mortgage for rental property 2	EUR 180,000
Private Investment			
Private stock for Jenny	EUR 2,000,000		
Real Property			
Personal residence	EUR 900,000		
Rental property 1	EUR 250,000		
Rental property 2	EUR 350,000		
Automobiles	EUR 75,000		
Other personal property	EUR 50,000		
Total Assets	EUR 7,115,000	Total Liabilities	EUR 640,000
		Total Net Worth	EUR 6,475,000

Beyond assets and liabilities, cash flows are also highly relevant to a private client's financial situation. Sources of cash flows may include employment income, business profit distributions, government income benefits, pensions, annuity income, and portfolio income/distributions. A projection of the client's annual expenses is valuable even if clients do not maintain detailed expense information. In addition, the relevance of expense information varies by client. For example, consider a young, modestly affluent couple versus an older couple who possess wealth that is well beyond their needs. For the young couple, expense information is vital for the wealth manager in determining

how much the couple can save toward their goals through improved budgeting. By contrast, obtaining detailed expense information is likely less important in the case of the older, wealthier couple, who are not as budget constrained.

3.1.3 Private Client Tax Considerations

A client's specific tax circumstances can be assessed from the client's tax returns. Tax returns, in particular, provide information that may not otherwise surface in conversations between the wealth manager and the client. In this section, we provide a basic overview of common types of taxes, discuss the global applicability of various tax types, and introduce basic tax strategies for private clients.

3.1.3.1 Common Tax Categories Taxes for individuals vary by jurisdiction, although some categories are reasonably consistent globally:

- *Taxes on income.* These include taxes on salaries, interest, dividends, capital gains, and rental income.
- *Wealth-based taxes.* These include taxes on the holding of certain types of property (e.g., real estate) and taxes on the transfer of wealth (e.g., taxes on inheritance).
- *Taxes on consumption/spending.* These include sales taxes (i.e., taxes assessed on the final consumer of goods or services) and value-added taxes (i.e., taxes assessed in the intermediate steps of producing a good or service but ultimately paid by the final consumer).

Capital gains taxes are a good illustration of the variability and complexity of global taxes. For example, in Canada, only half of an individual's "net" capital gains (i.e., total capital gains minus total capital losses) are included in taxable income and are taxed at the client's top marginal rate (that is, the rate to be paid on additional income). In the United States and several other jurisdictions, gains on securities over short-term holding periods are taxed at the client's highest marginal income tax rate, while gains on securities over long-term holding periods are taxed at a "long-term" capital gains rate that is generally lower than the marginal income tax rate. India also distinguishes between long-term and short-term capital gains and has several additional considerations that relate to taxes on securities transactions.

3.1.3.2 Basic Tax Strategies Taxes are normally reflected in a private client's financial plan and asset allocation decisions. While an in-depth discussion of tax strategies is beyond the scope of this reading, the following considerations are common to many clients:

- *Tax avoidance.* Individuals clearly prefer to avoid paying taxes, if possible. Tax avoidance should not be confused with illegal tax evasion. Some countries allow investors to contribute limited amounts to certain accounts that permit tax-free earnings and future withdrawals. Another example of tax avoidance involves various wealth transfer techniques. In a jurisdiction that permits limited amounts of gifts to be transferred without incurring gift taxes, the client can reduce the effects of an estate or inheritance tax both on the amount of the gift and on future capital appreciation.
- *Tax reduction.* Wealth managers typically seek opportunities to reduce the effect of taxes for private clients. For example, a wealth manager may recommend tax-exempt bonds that can produce a higher tax-adjusted return than taxable bonds. Or a wealth manager may recommend limiting exposure to asset classes with less favorable tax characteristics while increasing exposure to more tax-efficient asset classes.

- *Tax deferral.* By deferring the recognition of certain taxes until a later date, clients can benefit from compounding portfolio returns that are not diminished by periodic tax payments. Some investors in a progressive tax system (i.e., a system in which the tax rate increases as income increases) may also seek to defer taxes because they anticipate lower future tax rates. For example, a client with a high level of compensation (and a high marginal tax rate) during her working years may seek to defer taxes on investment income or gains until after retirement (assuming her marginal income tax rate will then be lower). Another example of a tax deferral strategy is limiting portfolio turnover and thus the realization of capital gains.

EXAMPLE 2

Basic Tax Strategies

Roseanna Rodriguez meets with her wealth manager, Raj Gupta, CFA, to discuss her investment strategy and financial plan. Gupta mentions the importance of tax strategies in Rodriguez's financial plan and makes three recommendations:

- 1 Invest in two different account types: (1) an account that permits both earnings and future withdrawals to be tax-free and (2) an account that permits earnings to accumulate tax-free but requires that taxes be paid when assets are withdrawn from the account.
- 2 Reduce exposure to an asset class with undesirable tax characteristics in favor of an asset class that is more tax-efficient.
- 3 Delay the sale of shares of a stock position until the year following retirement.

Identify the basic tax strategy (or strategies)—tax avoidance, tax reduction, or tax deferral—represented in each of the three recommendations.

Solution:

The first recommendation represents both tax avoidance and tax deferral. With the account that permits tax-free accumulation and distributions, Rodriguez would be avoiding taxes. With the account that permits tax-free accumulation but results in income taxes upon distribution, Rodriguez would be deferring taxes.

The second recommendation is an example of tax reduction because the recommended asset class would incur lower taxes. The third recommendation is an example of tax deferral and may also be an example of tax reduction if Rodriguez's tax rate declines after retirement.

3.1.4 Other Relevant Information

Private wealth managers typically gather other information from clients that is related to financial planning. For a client's estate plan (in applicable jurisdictions), the wealth manager obtains copies of relevant legal and governing documents, such as wills and trust documents. Wealth managers also obtain detailed information about the client's life insurance, disability insurance, excess liability coverage, and any other relevant insurance coverage.

We stated previously that private clients tend to have less formal governance models than institutional investors. As part of the information-gathering phase, wealth managers and clients typically establish decision-making parameters as part of investment governance. In fact, wealth managers have an opportunity to help *create* a governance model for clients. Wealth managers and clients normally agree on who can approve

and/or change investment policies, who can authorize trading activity, and who can authorize money transfers. When advising couples, it is important to establish whether one individual will be the primary contact with the wealth manager and whether each individual is authorized to make decisions on behalf of the other. Clear guidelines on these issues can minimize the possibility of future misunderstandings or conflicts.

Wealth managers seek information regarding clients' service needs and expectations. For example, it is helpful for the wealth manager to describe her standard practices for portfolio reporting (i.e., frequency, format, information content, and delivery method) and discuss whether the client has reporting needs that differ from the wealth manager's standard practices. When clients expect to have regular cash flow activity, such as periodic withdrawals from their portfolio, the wealth manager should assist in creating an efficient and secure process for executing these transactions. Finally, some clients prefer that their wealth manager interact directly with their other service professionals, such as accountants and legal representatives. The wealth manager and the client should have a clear understanding of what information should and should not be shared with these parties.

3.2 Client Goals

As part of the information-gathering process, wealth managers help private clients formulate and prioritize their goals. These goals may relate to education, property, discretionary spending, gifts to loved ones, health care, or other significant financial considerations. Financial goals are not always apparent, defined, or measurable: they may be expressed by clients as wishes, desires, or aspirations. When goals are uncertain or ambiguous, wealth managers have an opportunity to help clients understand their true objectives, to assess trade-offs and issues with respect to goal prioritization, and to align the client's investment strategy accordingly. This section focuses on the two types of financial goals that are typical of private clients—planned goals and unplanned goals.

3.2.1 Planned Goals

Planned goals are those that can be reasonably estimated or quantified within an expected time horizon. The following are some examples of planned goals:

- *Retirement.* Maintaining a comfortable lifestyle beyond their working years is a goal for most clients.
- *Specific purchases.* Client goals may focus on specific purchases, which tend to be a function of the level of wealth and/or stage of life. For instance, younger clients or those with relatively low levels of wealth may wish to save for a primary residence. In contrast, older clients or those with more significant levels of wealth may plan for a second residence, a vacation property, or other luxury items (e.g., art or rare collectibles).
- *Education.* Clients often wish to fund their children's education. The amount of expenditure needed for education varies widely. In some locations, such as the United States, the increase in education costs has significantly exceeded the general rate of inflation. Foreign exchange risk may be a factor for clients whose children study abroad.
- *Family events.* Family events, such as weddings, can be significant expenditures for clients.

- *Wealth transfer.* Clients typically plan for their wealth to outlast their own lifetime. An inheritance for beneficiaries may be transferred when the client dies or, in some cases, during the client's lifetime. When clients have a definite amount that they wish to transfer, this goal may need to be prioritized over other goals.
- *Philanthropy.* Clients often wish to make charitable donations during or after their lifetime. This objective may depend on a client's wealth level and country/region.

3.2.2 Unplanned Goals

Unplanned goals are those related to unforeseen financial needs. These goals are typically more challenging than planned goals because of the difficulty of estimating the timing and the amount of funding needed. The following are some examples of unplanned goals:

- *Property repairs.* Although households may be insured against losses or catastrophes, clients may face additional spending needs if insurance does not fully cover such events. The timing of these potential obligations is often uncertain.
- *Medical expenses.* Private client households normally have medical insurance for illness or hospitalization, but health insurance may not cover all medical expenses. The potential for unexpected medical expenses varies significantly by country/region. As with education costs, increases in health care costs in some countries/regions have far exceeded the general rate of inflation. A related issue in some locations is the potential cost of elder care for oneself or one's family members.
- *Other unforeseen spending.* Beyond property repairs and medical expenses, various other unexpected events commonly occur in the lives of private clients that may require significant financial outlays.

3.2.3 The Wealth Manager's Role

Goals are among the more complex aspects of a client's financial profile. Because goals are often not clearly defined, wealth managers play a direct role in helping clients articulate these objectives. The following are some relevant considerations in client goal creation:

- *Goal quantification.* Sometimes clients do not have specific, quantifiable goals that wealth managers can analyze. For example, a young client may be unable to estimate her future retirement lifestyle needs, while another client's well-articulated retirement needs may not be realistic in the private manager's assessment. In both cases, the wealth manager has an opportunity to formulate specific client goals. The wealth manager can help the client quantify each goal and plan accordingly.
- *Goal prioritization.* Private clients tend to have multiple, sometimes competing, goals. For example, ensuring a more secure retirement may mean less funding for the education of a client's grandchildren. When clients have competing

priorities, wealth managers have an opportunity to help them decide what matters most. Goal prioritization depends on what is most important to the client, not necessarily which needs occur sooner in the client's investment horizon.

- *Goal changes.* Individual investors' circumstances may change for a variety of reasons. When these changes occur, wealth managers sometimes must help clients re-prioritize their financial goals and reassess their investment strategy. Identifying client goals is not a one-time task but rather a part of an ongoing dialogue between wealth manager and client.

Example 3 provides an illustration of client goals for a fictitious individual, C.Y. Lee.

EXAMPLE 3

Client Goals

Mr. C.Y. Lee is a managing director for the investment firm Acme & Bass, which is located in the Asia-Pacific region. Lee is 43 years old, is married, and has two children, ages 12 and 10. He and his family reside in a home that they own in Singapore. In a conversation with his wealth manager, Lee states that he wishes to fund the undergraduate tuition for his children to study abroad. Lee expects the tuition cost to be approximately £40,000 per year. Lee also wishes to fund his children's weddings at some point in the future. Because the education costs will occur in the next 5–10 years, Mr. Lee states that they are his top priority.

Lee anticipates working until age 65 and does not know how much he and his wife will need to fund their retirement lifestyle. He mentions his desire to purchase a flat in London and let (rent) it as part of their retirement plan. The flat would cost approximately £1.5 million. Lee is also concerned about the future health care expenses of his wife's parents and to what degree he and his wife may need to support them financially.

- 1 Identify Lee's planned goals.
- 2 Identify Lee's unplanned goals.
- 3 Discuss the issue of goal quantification for Lee.
- 4 Discuss the issue of goal prioritization for Lee.

Solution to 1:

Lee's planned goals are (a) funding his children's education; (b) funding his children's weddings; (c) funding his and his wife's retirement; and (d) purchasing and subsequently letting (renting) a flat in London.

Solution to 2:

Lee's unplanned goals relate to the future health care expenses of his wife's parents, as well as possible uninsured property repairs for the Lee's Singapore residence and, if purchased, their London flat.

Solution to 3:

Lee has quantified the education funding goal and the flat purchase. He and his wealth manager should work to estimate the cost of the weddings for Lee's children and the anticipated retirement lifestyle needs for Lee and his wife.

Solution to 4:

Lee states that his first priority is education funding for his children. However, the timing of a need should not be the sole determinant of goal priority. If funding their children's education costs will leave Lee and his wife unprepared for retirement, for example, they may wish to reevaluate their priorities.

3.3 Private Client Risk Tolerance

Evaluating a private client's risk tolerance is a key step in the information-gathering process. In practice, the term *risk tolerance* sometimes is used to describe a set of risk-related concepts. The following are some key terms used in this context:

- **Risk tolerance** refers to the level of risk an individual is willing and able to bear. Put another way, risk tolerance is the willingness to engage in a risky behavior in which possible outcomes can be negative. Risk tolerance is the inverse of **risk aversion**, which is the degree of an investor's *unwillingness* to take risk.
- **Risk capacity** is the ability to accept financial risk. The key difference between risk capacity and risk tolerance is that risk capacity is more objective in nature, while risk tolerance relates to an attitude. Risk capacity is determined by the client's wealth, income, investment time horizon, liquidity needs, and other relevant factors. Clients with greater risk capacity can tolerate greater financial losses without compromising current or future consumption goals.
- **Risk perception** is the subjective assessment of the risk involved in the outcome of an investment decision. Unlike risk tolerance, risk perception—how a client perceives the riskiness of an investment decision or the investment climate—depends on the circumstances involved. Consequently, a wealth manager can help shape a client's risk perception. Generally speaking, risk perception varies considerably among individuals.

3.3.1 Risk Tolerance Questionnaire

In practice, wealth managers often utilize questionnaires to assess clients' risk tolerance. The result of a risk tolerance questionnaire, typically a numerical score, is often used as an input in the investment planning process. Exhibit 2 provides some common types of questions that may be found on a risk tolerance questionnaire.

Exhibit 2

Sample Questions from a Risk Tolerance Questionnaire

- 1 When you make investment decisions, on which of the following do you tend to focus?
 - a Always on the potential for gain
 - b Usually on the potential for gain
 - c Always on the potential for loss
 - d Usually on the potential for loss
- 2 Compared to your friends and family, are you:
 - a less willing to take risk?
 - b equally willing to take risk?
 - c more willing to take risk?

(continued)

Exhibit 2 (Continued)

- 3 What potential percentage decline in your investment portfolio value over a one-year period are you willing to experience?
 - a 5%
 - b 10%
 - c 20%
 - d 30%
 - e More than 30%
- 4 Which of the following statements best describes your attitude about the performance of your investment portfolio over the next year?
 - a I can tolerate a substantial loss.
 - b I can tolerate a loss.
 - c I can tolerate a small loss.
 - d I would have a hard time tolerating a loss of any magnitude.
- 5 Suppose that you have made an investment that, due to a sudden broad market decline, has declined in price by 25%. Which of the following actions would you take?
 - a Sell all of the investment.
 - b Sell a portion of the investment.
 - c Hold the investment (take no action).
 - d Buy more of the investment.
- 6 Suppose that you have access to two types of investments: one investment with low risk and low expected return and one with high risk and high expected return. Which of the following portfolio mixes would you select?
 - a 100% low risk/low return
 - b 75% low risk/low return and 25% high risk/high return
 - c 50% low risk/low return and 50% high risk/high return
 - d 25% low risk/low return and 75% high risk/high return
 - e 100% high risk/high return
- 7 Suppose that you are offered employment that involves the choice of a fixed salary, variable compensation that could be higher or lower than the fixed salary, or some mix of the two. Which of the following would you choose?
 - a Entirely fixed salary
 - b Mostly fixed salary
 - c Entirely variable compensation
 - d Mostly variable compensation
 - e An equal mix of the two

Risk tolerance questionnaires are not perfect and it is unclear whether they are predictive of investor behavior. Recommending an investment or an asset allocation for a client based upon the questionnaire requires significant judgment on the part of a wealth manager. In fact, academic studies indicate a high degree of subjectivity in the client questionnaire approach. This subjectivity increases the potential for the wealth manager's own views on risk to become an influential factor in making

investment decisions for a client. Other studies demonstrate how the structuring of questions affects investor responses. For example, presenting a loss in either percentage or dollar terms can lead to different responses from the same individual. Similarly, a question that involves a small dollar loss on a small portfolio may generate a different response than a question involving a large dollar loss on a large portfolio, even if the percentage losses are the same.

3.3.2 Risk Tolerance Conversation

As in the information-gathering process described earlier, conversations with the client can produce valuable insights into that individual's risk tolerance that may not be evident from a risk tolerance questionnaire or an assessment of personality type. These insights may include the following:

- The degree to which the client's financial decisions are influenced by friends or family members.
- The financial experiences that have shaped the client's perspective: For example, individuals who lived through deep recessions, even in childhood, may bring that perspective to present-day investment decisions.
- The client's past investment mistakes and successes.
- The client's accumulation of investment wealth—for example, whether the client achieved wealth through saving, inheritance, a liquidity event, or some combination thereof.
- The client's evaluation of investment risk—that is, whether the client thinks of investment losses in absolute or percentage terms.

Conversations about risk tolerance enable the wealth manager to educate a client about investment risk. For example, a wealth manager may demonstrate how certain risk factors (e.g., interest rate risk, credit risk, and equity risk) can produce incremental returns as well as incremental losses. As another example, a wealth manager may ask a client to select from a “menu” of portfolio options with a range of expected returns and degrees of volatility. The client's choice from this menu provides some information about the individual's risk tolerance.

3.3.3 Risk Tolerance with Multiple Goals

To this point, we have discussed a client's overall risk tolerance. Because clients often have multiple goals or objectives, their risk tolerance may vary for different goals. For example, a client may have a low risk tolerance with respect to near-term goals (such as education costs) but a higher risk tolerance when it comes to longer-term goals (such as retirement needs). A challenge for wealth managers in managing client relationships is to satisfactorily address potentially conflicting risk tolerance levels.

3.4 Technical and Soft Skills for Wealth Managers

Private wealth management resembles both an art and a science. That is, a wealth manager needs to have the professional aptitude to understand the client's financial goals, objectives, and constraints, as well as the financial acumen to recommend appropriate investments and portfolio management solutions. In short, wealth managers need both technical skills and non-technical (“soft”) skills to succeed in their advisory roles.

3.4.1 Technical Skills

Technical skills represent the specialized knowledge and expertise necessary to provide investment advice to private clients. In some jurisdictions, regulators require minimum qualifications for technical skills among wealth managers. Examples of technical skills include the following:

- *Capital markets proficiency.* Private wealth management requires an understanding of capital market dynamics as part of helping clients achieve their financial goals. In most cases, wealth managers must have a broad understanding of capital markets and asset classes, as opposed to a specialist viewpoint. For example, a wealth manager will likely not have the same sector- or security-level expertise as an equity analyst who focuses on a specific industry.
- *Portfolio construction ability.* In conjunction with capital markets proficiency, private wealth managers need the ability to construct portfolios that are appropriate for each client's financial situation. This ability requires a deep understanding of asset class risks and returns; an awareness of the correlations among asset classes; and knowledge of investment vehicles, managers, products, and strategies for implementing a client's investment program.
- *Financial planning knowledge.* Wealth managers are typically not experts in specialized financial planning fields such as estate law, taxation, and insurance. However, these fields are highly relevant to the practice of wealth management. As a result, wealth managers who have a working knowledge of these related fields can add meaningful value for a client and can more effectively interact with the other professionals who serve that client.
- *Quantitative skills.* Given the need for investment analysis and portfolio construction, quantitative skills are critical for private wealth managers.
- *Technology skills.* Wealth managers use technology to manage client portfolios as well as improve efficiency in delivering advice and services. Examples of technology used by wealth managers include portfolio optimization software, simulation modeling tools, portfolio management software, portfolio accounting and performance reporting packages, and customer relationship management (CRM) software.
- *Language fluency.* In some situations, the ability to communicate in more than one language is a critical technical skill—for example, when a wealth manager has a multinational client base, manages cross-border transactions, or works in markets where more than one language is commonly spoken.

3.4.2 Soft Skills

Soft skills typically involve interpersonal relationships—that is, the ability to effectively interact with others. While soft skills are more qualitative and subjective than technical skills, they are critical nonetheless in the practice of private wealth management. Soft skills include the following:

- *Communication skills.* Because wealth managers interact extensively with clients, strong communication skills are essential. Communication skills begin with active listening when gathering client information. Effective verbal communication requires being able to ask the right questions as well as knowing *how* to ask questions. Meanwhile, effective written communication has become even more relevant with the increased use of email for communicating with clients. Presentation skills are commonly needed by wealth managers for engaging in group meetings and understanding the sophistication of the audience.

- *Social skills.* The ability to understand and relate to others and demonstrate empathy is a critical skill for wealth managers, particularly when “bad news” (e.g., poor investment performance) needs to be delivered to clients. Social skills also include the ability to read and interpret various non-verbal cues, such as body language.
- *Education and coaching skills.* An important role for a wealth manager is to educate and coach clients about investing and the wealth management process. Effective wealth managers are able to tailor this education and coaching to a client’s level of sophistication.
- *Business development and sales skills.* Wealth managers often participate in or lead new business development for their firms or practices. Business development involves initiating contact with prospective clients (often called “prospects”), while the sales aspect involves successfully converting prospects into actual clients. Business development and sales entail several of the technical and soft skills previously mentioned. For example, wealth managers need to demonstrate capital markets and investment expertise while using effective communication and social skills.

EXAMPLE 4

Technical and Soft Skills

John Müller, CFA, a private wealth manager, recently received feedback from clients and colleagues as part of his performance review. Clients commented favorably on how Müller coordinates with external tax and legal professionals and on how well he listens to and understands his clients’ needs. Colleagues remarked on Müller’s broad knowledge of traditional and alternative asset classes and his ability to obtain new client engagements.

Describe which technical and soft skills Müller demonstrated as part of his performance review.

Solution:

In his performance review, Müller demonstrated the technical skills of capital markets proficiency and financial planning knowledge. Müller’s capital markets proficiency was shown through his broad knowledge of traditional and alternative asset classes, while his financial planning knowledge was shown by his successful coordination with tax and legal professionals. In addition to technical skills, Müller demonstrated the soft skills of communication and business development and sales. Communication skills were shown by his ability to listen well and understand client needs, while business development and sales skills were shown by his record of obtaining new client engagements.

INVESTMENT PLANNING

4

After developing an understanding of their clients, wealth managers begin the process of helping clients meet their objectives. In this section, we discuss key investment planning concepts, such as capital sufficiency analysis, retirement planning, and the client’s investment policy statement.

4.1 Capital Sufficiency Analysis

To meet their financial goals and objectives, clients must have sufficient capital or follow a plan that will likely result in sufficient capital. **Capital sufficiency analysis**, also known as **capital needs analysis**, is the process by which a wealth manager determines whether a client has, or is likely to accumulate, sufficient financial resources to meet his or her objectives.

4.1.1 Methods for Evaluating Capital Sufficiency

Two methods for evaluating capital sufficiency are deterministic forecasting and Monte Carlo simulation. Portfolio growth in a deterministic model occurs in a “straight-line” manner. For example, suppose a client’s investment horizon is 15 years and the wealth manager has determined that the portfolio’s likely compound annual return is 6%. In deterministic forecasting, the client is expected to achieve a 6% return in each of the 15 years in the analysis. While simple to understand, the deterministic method is typically unrealistic with respect to the variability in potential future outcomes.

By contrast, Monte Carlo simulation allows a wealth manager to model the uncertainty of several key variables and, therefore, the uncertainty or variability in the future outcome. Monte Carlo simulation generates random outcomes according to assumed probability distributions for these key variables. Instead of assuming, for instance, linear portfolio growth of 6% per year, Monte Carlo simulation would assume a simple average (arithmetic mean) return and a standard deviation of year-to-year returns for the portfolio. The portfolio’s expected rate of return in a given year is determined randomly from this predefined distribution of possible returns. Monte Carlo simulation generates a large number of independent “trials,” each of which represents one potential outcome for the client’s investment horizon. By aggregating the outcomes of these various trials, the wealth manager is able to draw conclusions about the probability that the client will reach his or her objectives. It should be noted that such conclusions are sensitive to underlying assumptions, which may be subjective in nature.

4.1.2 Inputs to Capital Sufficiency Analysis

When using deterministic forecasting, the wealth manager must specify the following inputs: a portfolio return assumption, the current value of the portfolio, anticipated future contributions to the portfolio, and cash flows from the portfolio that represent client needs (according to the client’s goals). As mentioned earlier, with Monte Carlo simulation, the wealth manager assumes a simple average return and a standard deviation of returns for the portfolio, rather than determining an annual portfolio growth rate. Wealth managers should be cautious about using historical rates of return as inputs to either a deterministic forecast or a Monte Carlo simulation. Instead, forward-looking capital market assumptions should be the foundation for the analysis.

In some cases, the inputs to Monte Carlo simulation are more complex. Portfolio return is not the only input that can be made variable. Some Monte Carlo simulation software requires separate asset class assumptions—such as simple average return, standard deviation, and correlation with other portfolio asset classes—rather than assumptions at the overall portfolio level. Some software packages enable variability in the client’s investment horizon, such as their life expectancy. Other common inputs to capital sufficiency analysis for private clients include taxes, inflation, and investment management fees.

4.1.3 Interpreting Monte Carlo Simulation Results

When performing a capital sufficiency analysis, one role of a wealth manager is to interpret the results for the client. Suppose a wealth manager has run a Monte Carlo simulation for a client portfolio that generates a thousand trials. The output for this fictitious portfolio is shown in Exhibit 3.

The table in Exhibit 3 illustrates portfolio values (adjusted for inflation) at specific time intervals and at certain percentiles of the thousand trials. The table also shows the percentage of trials at a given horizon in which the client successfully achieved her objective. For instance, after 10 years, a portfolio value of \$765,821 at the 75th percentile indicates that in 75% of the trials, the portfolio value after 10 years *exceeded* \$765,821. Similarly, over this same 10-year period, only 5% of trials resulted in a portfolio value that exceeded \$3,519,828. “Successful Trials” at the bottom of the table indicates, for example, that after 20 years, 69% of the trials were successful; that is, the client failed to meet her objective in 31% of trials. The percentage of successful trials is also known as the “probability of success.” Wealth managers tend to guide clients toward a 75%–90% probability of success, although no industry standard range exists.

Exhibit 3 Monte Carlo Simulation Results

Percentile	Year 10 Portfolio Value	Year 15 Portfolio Value	Year 20 Portfolio Value
5th	\$3,519,828	\$3,651,264	\$3,647,328
25th	\$1,981,861	\$1,698,449	\$1,530,372
50th	\$1,239,837	\$843,820	\$569,974
75th	\$765,821	\$305,126	(\$249,205)
95th	\$197,179	(\$264,048)	(\$1,402,608)
Successful Trials	98%	88%	69%

When the probability of success falls below an acceptable range, potential solutions include the following:

- Increasing the amount of contributions toward a goal
- Reducing the goal amount
- Delaying the timing of a goal (e.g., retiring a few years later than originally planned)
- Adopting an investment strategy with higher *expected* returns, albeit within the client’s acceptable risk tolerance and risk capacity

In light of these solutions, wealth managers should be careful about allowing capital sufficiency analysis to completely drive portfolio construction. For example, if a client’s risk tolerance does not allow for an asset allocation with a higher expected return, adopting a higher-risk strategy may cause the client to abandon the strategy at a market extreme, thus undermining the portfolio’s ability to meet the investor’s objectives.

EXAMPLE 5**Monte Carlo Simulation**

Reyansh and Pari Patel are saving to send their sons Rohan (age 4) and Vihaan (age 6) to college in the United States. Thus far, they have saved approximately \$170,000. They will be able to save an additional \$20,000 toward this goal in the next year and to increase the amount each year by 3% to address inflation. Current annual tuition costs are \$40,000, and the Patels expect tuition to increase 6% annually.

The Patels' wealth manager, Sai Chhabra, CFA, uses a Monte Carlo simulation to calculate the probability of meeting the college tuition objective. The Monte Carlo simulation results are shown in Exhibit 4.

Exhibit 4 Monte Carlo Simulation Results

Percentile	Year 10 Portfolio Value	Year 15 Portfolio Value	Year 20 Portfolio Value
5th	\$618,860	\$608,445	\$429,512
25th	\$499,552	\$409,753	\$212,123
50th	\$433,375	\$309,823	\$71,849
75th	\$213,121	\$219,852	(\$22,578)
95th	\$301,502	\$121,849	(\$79,845)
Successful Trials	100%	100%	67%

Discuss how the Patels might increase the probability of success in meeting their college tuition goal.

Solution:

To increase the probability of success in meeting their tuition goal, the Patels should consider three possible solutions:

- 1 Increase their annual contributions toward this goal.
- 2 Reduce the goal amount, perhaps by funding a portion of the tuition costs or by identifying schools with lower tuition costs.
- 3 Adopt an investment strategy with higher expected returns that is still within the Patels' acceptable risk tolerance and risk capacity.

A fourth possibility—delaying the timing of the goal—is not a practical solution, given the ages of the sons and when they intend to enter college.

4.2 Retirement Planning

For many investors, funding their retirement lifestyle represents the largest and most important financial objective. Retirement planning has grown in significance as life expectancies have increased globally. In 1960, 65-year-old men in developed countries had a life expectancy of approximately 11 to 14 years, while 65-year-old women had a

life expectancy of 14 to 16 years.⁴ Since that time, the life expectancy of 65-year-old individuals (both men and women) has increased considerably. The increased emphasis on retirement planning has also been driven by a shift in the primary responsibility for funding retirement from employers and governments to individuals.

In this section, we discuss various principles of retirement planning, including the retirement stage of an individual's life, the analysis of retirement goals, and behavioral considerations for retired clients.

4.2.1 Retirement Stage of Life

A wealth manager's role in retirement planning includes assessing how much clients must save toward their retirement goals and helping clients determine at what age they will be financially prepared for retirement. Unlike institutional investors, which often have quantifiable liabilities, private clients may have difficulty estimating their future financial needs. Therefore, wealth managers have an opportunity to help shape clients' expectations about their future retirement lifestyle.

An overview of the following financial stages of life provides some context for our discussion of retirement planning:

- Education
- Early career
- Career development
- Peak accumulation
- Pre-retirement
- Early retirement
- Late retirement

During the education stage, an individual is typically developing human capital rather than financial capital. In this context, **human capital** is an implied asset that represents the net present value of an investor's future expected labor income, while **financial capital** represents the tangible and intangible assets (excluding human capital) owned by an individual or household. Individuals normally begin to accumulate assets for retirement in the early career stage. During this stage, individuals often have competing financial priorities, such as family needs, housing costs, and education. Retirement planning tends to take on greater importance as individuals move into the career development stage and, later, into the peak accumulation and pre-retirement stages. As individuals work and save money for retirement, they convert their human capital into financial capital. They also accumulate other financial benefits, such as pensions and government-provided retirement income, and they reduce non-retirement liabilities, such as mortgage loans and consumer debt.

In the early retirement stage, clients begin to draw from both financial resources and income sources for their retirement spending. Cash flows come from the client's investment portfolio as well as from pension income, government-provided retirement benefits, and if applicable, part-time or full-time employment.

In the late retirement stage, clients generally reduce expenditures on travel and leisure activities. Also during this stage, some individuals experience health issues that, in some countries, result in an increased burden on financial resources.

One of the wealth manager's roles in the early retirement and late retirement stages is determining a sustainable rate of distribution from the client's investment portfolio. This analysis is done on an ongoing basis to ensure that clients' financial resources will cover their remaining lifetime needs. That is, retirement planning does not begin or end with the client's retirement.

⁴ These data were obtained from the Organisation for Economic Co-operation and Development (OECD).

4.2.2 Analyzing Retirement Goals

Wealth managers may use several different methods to analyze a client's retirement goals. Three common methods—mortality tables, annuities, and Monte Carlo simulation—are discussed below.

4.2.2.1 Mortality Tables A **mortality table** indicates individual life expectancies at specified ages. Wealth managers can use mortality tables to determine the probability that a client will live to a certain age; they can then estimate the client's anticipated retirement spending over his or her remaining lifespan.

Example 6 shows a sample mortality table. In the table, the plan year, client age, remaining life expectancy in years, and probability of surviving to a certain year are provided. This client is currently 72 years old and has a life expectancy of 12 years. The probability that he will survive to age 87 (i.e., 15 years from now) is 34%. The probability that he will survive to age 92 (i.e., 20 years from now) is 14%.

In practice, a wealth manager can use a mortality table to estimate the present value of a client's retirement spending needs by assigning associated probabilities to annual expected cash outflows.

EXAMPLE 6

Sample Mortality Table

Plan Year	Client Age	Life Expectancy	Survival Probability
0	72	12.0	100%
1	73	11.4	97%
2	74	10.8	93%
3	75	10.2	90%
4	76	9.7	86%
5	77	9.1	82%
6	78	8.6	77%
7	79	8.1	73%
8	80	7.6	68%
9	81	7.2	64%
10	82	6.7	59%
11	83	6.3	54%
12	84	5.8	49%
13	85	5.5	44%
14	86	5.1	39%
15	87	4.7	34%
16	88	4.4	29%
17	89	4.1	25%
18	90	3.8	21%

Plan Year	Client Age	Life Expectancy	Survival Probability
19	91	3.5	17%
20	92	3.3	14%

Source: Kitces and Hultstrom, "Joint Life Expectancy and Mortality Calculator." <https://www.kitces.com/joint-life-expectancy-and-mortality-calculator/> (accessed September 14, 2018).

One potential drawback to using mortality tables is that an individual client's probability of living to a certain age may exceed that of the general population. Factors such as education level and access to quality health care tend to correlate with increased longevity. Therefore, the survival probabilities from an actuarial perspective may understate the true probability of a given client's living to a given age.

4.2.2.2 Annuities *Annuities* can be used to analyze a client's retirement goals. A relatively simple way of calculating the present value of a client's desired retirement spending is by pricing an annuity. Annuities provide a series of fixed payments, either for life or for a specified period, in exchange for a lump sum payment. Many types of annuities exist, some of which are quite complex. Two basic forms are the immediate annuity and the deferred annuity. With an **immediate annuity**, an individual (called the "annuitant") pays an initial lump sum, typically to an insurance company, in return for a guarantee of specified future monthly payments—beginning immediately—over a specified period of time. With a **deferred annuity**, the specified future monthly payments begin at a later date. Suppose a husband and wife, both age 65, wish to retire with \$100,000 per year in inflation-adjusted income. An immediate fixed annuity with "100% survivor income" might cost the couple approximately \$2,500,000. The percent of survivor determines how much of the original annual income amount will go to the surviving spouse after the death of the first spouse. In this example, in exchange for \$2,500,000 today (i.e., present value), the insurance company promises to pay \$100,000 per year, adjusted for inflation, through the lifetime of the surviving spouse.

Life annuities are those in which the income stream continues as long as the annuitant lives. Using mortality tables, a wealth manager calculates the client's retirement liability based upon the individual's life expectancy. If the client lives longer than the actuarial statistics assume, the client's actual retirement spending needs will exceed the amount that the wealth manager and client planned for. This scenario introduces **longevity risk**, which is the risk of outliving one's financial resources. Life annuities help to mitigate longevity risk.

4.2.2.3 Monte Carlo Simulation Revisited Earlier, we discussed Monte Carlo simulation in the context of determining a client's capital sufficiency. Monte Carlo simulation can also be used to analyze a client's retirement goals. One advantage of Monte Carlo simulation is its applicability to the client's actual asset allocation. For instance, if a client does not intend to use annuities for retirement needs, then annuity pricing will not be useful in estimating the client's lifestyle needs. Instead, Monte Carlo simulation can be used to analyze the likelihood that the client's actual portfolio will meet anticipated retirement needs.

Another advantage of Monte Carlo simulation for retirement planning is its flexibility in modeling different scenarios and exploring issues that are important to clients. Typically, retirement goals are more complex than a fixed annual cash flow requirement. For instance, if a client wishes to determine the effect of a significant purchase/gift or large unforeseen expense, the wealth manager can model these scenarios with Monte Carlo simulation.

Wealth managers should be careful about the degree of precision that Monte Carlo simulation provides. Simulation modeling is only a method of estimation; it cannot predict the future. Moreover, the output from Monte Carlo simulation can be highly sensitive to small changes in input assumptions. This is especially true for the portfolio rate of return assumption. Finally, a typical Monte Carlo output includes the probability of reaching a goal (or goals) but not necessarily the “shortfall magnitude.” Shortfall magnitude matters because if clients are at risk of not meeting their objectives, they can make adjustments. If the shortfall is severe, the necessary adjustment may be significant.

EXAMPLE 7

Retirement Planning

Emily Whitfield, CFA, is meeting with two different clients today, Sam and Rebecca, regarding their retirement plans. Sam is retiring soon. He wants to be certain to have €100,000 per year in income throughout retirement. Rebecca is interested in exploring several possible scenarios for her retirement, using assumptions that are specific to her actual portfolio.

Recommend the method of analyzing retirement goals that is most appropriate for each of these two clients.

Solution:

For Sam, annuities are most appropriate. The price of an annuity that produces €100,000 per year for life will determine how much Sam must have saved for retirement. For Rebecca, Monte Carlo simulation is most appropriate because she is interested in analyzing how different portfolio scenarios will affect her retirement plans.

4.2.3 Behavioral Considerations in Retirement Planning

Several behavioral considerations are relevant to retired clients and/or retirement planning. The following are some examples:

- *Heightened loss aversion.* Some studies suggest that retirees are much more loss-averse than younger investors. This observation has implications for clients’ asset allocation through retirement and, therefore, for the return assumptions used in retirement planning.
- *Consumption gaps.* Due to loss aversion and uncertainty about future financial needs, many retirees spend less than economists would predict, resulting in a gap between actual and potential consumption.
- *The “annuity puzzle.”* While annuities can help to mitigate longevity risk and, in some cases, may improve the probability of retirees meeting their spending objectives, individuals tend not to prefer to invest in annuities. This phenomenon is known as the “annuity puzzle.” Explanations for the puzzle include investors’ reluctance to give up hope of substantial lifestyle improvement, their dislike of losing control over the assets, and, in many cases, the high cost of annuities.
- *Preference for investment income over capital appreciation.* Behavioral economists have noted that individuals distinguish between income and capital when making spending choices. Evidence for this behavior includes the tendency of investors to spend dividend income rather than selling shares of securities and

spending the proceeds. One possible explanation is that investors lack self-control with respect to spending. This theory suggests that spending only the income and not the principal is a self-control mechanism.

INVESTMENT POLICY STATEMENT

5

The **investment policy statement** (IPS) is a written planning document that describes a client's investment objectives and risk tolerance over a relevant time horizon, along with the constraints that apply to the client's portfolio. A wealth manager typically produces this document prior to constructing and implementing the client's investment portfolio. The IPS creates a link between the client's unique considerations and their strategic asset allocation. The IPS is also an operating manual, listing key ongoing management responsibilities. The client and wealth manager should review the IPS regularly and update it whenever changes occur either in the client's circumstances or in the capital markets environment that impact the client's investment strategy.

A well-constructed IPS has certain advantages for private clients. One advantage is that the IPS encourages investment discipline and reinforces the client's commitment to follow the strategy. This advantage is particularly important during adverse market conditions. A second advantage is that the IPS focuses on long-term goals rather than short-term performance. For the wealth manager, the IPS provides evidence of a professional, client-focused investment management process and the fulfillment of fiduciary responsibilities.

5.1 Parts of the Investment Policy Statement

The IPS includes the client's background and investment objectives, the key parameters of the investment program, the portfolio asset allocation, and some discussion of the duties and responsibilities of relevant parties. Topics addressed in most IPSs for private clients are discussed below.

5.1.1 *Background and Investment Objectives*

The client's background and investment objectives are critical parts of the IPS. Background items commonly include the client's name and age, as well as relevant personal and financial information. The wealth manager gains an understanding of the client's investment objectives during the information-gathering process. Common objectives include funding lifestyle needs during retirement, supporting family members, funding philanthropic activities, and meeting bequest goals. These examples typically represent ongoing objectives. By contrast, one-time objectives may include the purchase of a second home or a significant future travel expense. It is common for private clients to have multiple, competing objectives that they seek to achieve with the same portfolio.

Investment objectives should be detailed and quantified whenever possible. For instance, a client who is about to retire may seek to withdraw a specific amount each year that increases with the annual rate of inflation. A client also may have specific amounts in mind for future bequests or for charitable gifts. By comparison, oversimplified investment objectives such as "growth" or "growth and income" would not be sufficiently detailed.

Sometimes, clients have difficulty assigning specific amounts to future objectives. When this is the case, the wealth manager can create a more general objective, with the understanding that he will continue to work with the client to determine an achievable specific objective.

The wealth manager should also include in this section of the IPS other cash flows that are linked to investment objectives and that will therefore affect the capital sufficiency analysis. For instance, if a client intends to contribute additional amounts to her investment portfolio each year before subsequently beginning periodic withdrawals, the objective should reflect the expected contributions. Likewise, if the client anticipates that a significant liquidity event, such as the sale of a business, will be integral to meeting the investment objective, that information should be included in this section.

In a situation involving multiple objectives, the wealth manager should note which of the objectives is primary. For example, clients may wish to support their lifestyle needs through retirement while preserving an inheritance for their children. In this common example, the primary objective is the client's retirement security and the secondary objective is the inheritance for the children.

The investment objective, when linked to the client's asset allocation and the wealth manager's capital market assumptions, should provide the basic inputs to a capital sufficiency analysis. Whenever the capital sufficiency analysis does not support the investment objective, the wealth manager must work with the client to establish a revised objective that the manager judges to be achievable.

As part of the overall client background, the IPS should include the market value of the portfolio and of the accounts that make up the portfolio. The wealth manager should indicate the tax status of the account—that is, whether it is taxable, as in the case of an individual or joint account, or tax-deferred, as in the case of certain retirement plan accounts. When accounts are tax-deferred, the client pays tax on the distributions from the account rather than on the income generated by the investments. The background and investment objectives section should describe any other investment assets the client may have outside of the portfolio (e.g., accounts managed by another wealth manager) and any cash flows from external sources (e.g., pension income).

EXAMPLE 8

Background and Investment Objectives

Huang Zhuo Wei, age 51, is a private investor in Singapore. Wei is an engineer by trade but has also been successful in real estate development. His portfolio consists of CNY 16.5 million in a liquid securities portfolio, including some common stock positions in which he has large embedded capital gains, and several real estate investments valued at approximately CNY 9 million (combined). He expects to make additional real estate investments in the coming years. He estimates that he can invest approximately CNY 330,000 per year, inflation-adjusted, in real estate until retirement. He has a much higher than average tolerance for volatility, and historically, his liquid portfolio has consisted mostly of large-cap stocks of technology companies. He has stated that his time horizon is 10 years, since he anticipates retiring in approximately 10 years. He estimates that he will need approximately CNY 1 million per year, inflation-adjusted, to support his lifestyle in retirement. He wishes to grow his investment resources and create a significant inheritance for his children.

Discuss how Wei's wealth manager should create the investment objectives section of Wei's IPS.

Solution:

The purpose of this portfolio is to support Wei's lifestyle in retirement and to provide an inheritance for his children. Aside from the investment assets in his portfolio, Wei has private real estate investments valued at approximately

CNY 9 million and is likely to add to this segment of his net worth over the next several years. Wei does not anticipate needing distributions from this portfolio for at least 10 years.

Wei estimates an annual, inflation-adjusted lifestyle need of approximately CNY 1 million per year beginning at his retirement in 10 years. His cash needs will be satisfied in part through portfolio distributions and in part from his real estate portfolio. The wealth manager will continue to work with Wei to quantify his bequest objective and ensure that his portfolio distribution rate is sustainable throughout his retirement.

5.1.2 Investment Parameters

The investment parameters section of the IPS outlines important preferences that influence the client's investment program. Wealth managers may need to refine or customize these preferences to suit the particular client. Relevant components of investment parameters are discussed below.

5.1.2.1 Risk Tolerance In this part of the investment parameters section, the wealth manager indicates that she has considered the client's ability and willingness to withstand portfolio volatility. The process by which the wealth manager has assessed the client's risk tolerance is included here. For instance, if a risk tolerance questionnaire is used in the data-gathering process, the wealth manager may choose to include conclusions from the questionnaire.

5.1.2.2 Investment Time Horizon A client's investment horizon is indicated in this section, but often as a range rather than a specific number of years. If the wealth manager determines that the client has a long horizon, the IPS may state, for instance, that it "exceeds 15 years." By contrast, a short horizon may be described as "less than 10 years." Clients do not often indicate their own investment time horizons because they may misjudge the appropriate length. For example, married couples might underestimate their joint life expectancy. In general, the wealth manager should determine the investment time horizon in collaboration with the client. Because each goal may have a different time horizon, a client may have multiple time horizons (some of which may exceed the client's lifetime).

EXAMPLE 9

Investment Time Horizon

In Example 8, Huang Zhuo Wei stated that his investment horizon is 10 years because he expects to retire at that point.

Discuss how his wealth manager should reflect Wei's investment horizon in the IPS.

Solution:

Wei's true investment horizon is *through* retirement, a period that likely will be much longer than 10 years. His wealth manager should describe his time horizon as exceeding 10 years.

5.1.2.3 Asset Class Preferences The IPS should indicate the asset classes that will comprise a client's portfolio. Alternatively, the wealth manager may list the asset classes that the client has not approved. Some wealth managers include a short narrative about the importance of asset allocation and the process that the wealth manager used to

educate the client about asset class risk and return characteristics. The narrative captures in written form the risk–return trade-off that the client explored with the wealth manager during the information-gathering process.

5.1.2.4 Other Investment Preferences Some clients have additional important investment preferences. One example relates to ESG investing, whereby a client may desire to invest in companies or sectors that are environmentally or socially focused. This section may contain a general comment about or specific criteria about for these ESG preferences.

Other investment preferences described in this section might be a “legacy” holding that the client wishes to retain or a non-recommended investment that the client wishes to make. For example, a client may choose to retain a common stock investment received via inheritance or maintain a position in company stock due to the nature of the client’s employment.

5.1.2.5 Liquidity Preferences If the client has liquidity needs that are not established in the background and investment objectives section, those needs should be noted here. Some investors maintain a cash reserve in their portfolio, whereas other investors must initiate a portfolio distribution when they encounter an unanticipated cash need. Clients who require additional liquidity in their portfolios may instruct the wealth manager to maintain a specific cash balance in the portfolio.

If the client’s liquidity preference constrains asset class selection decisions or implementation decisions, that constraint should be listed here. For example, if a client’s liquidity needs dictate that entire portfolio can be sold relatively quickly and easily, illiquid asset classes such as private equity would likely not be part of the client’s portfolio.

5.1.2.6 Constraints Some clients have constraints that restrict the wealth manager from implementing certain investments or strategies. For example, a client may be constrained by investment options in certain accounts, such as an employer-sponsored defined contribution retirement plan account. Another significant constraint can involve investments that have large unrealized capital gains and would create significant tax liabilities upon disposition. If a client has ESG-related constraints, such as prohibiting investment in certain sectors or individual securities, those constraints should appear in this section.

5.1.3 Portfolio Asset Allocation

This section contains the target allocation for each asset class in the client’s portfolio. Wealth managers who use a strategic asset allocation approach typically define a target allocation for each asset class as well as upper and lower bounds. Wealth managers who use a tactical asset allocation approach may list asset class target “ranges” rather than specific target allocation percentages.

5.1.4 Portfolio Management

In this section of the IPS, the wealth manager discusses various issues involved in the ongoing management of the client portfolio. These issues may include the level of discretionary authority, how and when rebalancing activity will take place, and if relevant, tactical asset allocation changes within the client’s portfolio.

5.1.4.1 Discretionary Authority The IPS indicates the degree of discretionary authority that the client has granted to the wealth manager. Discretionary authority refers to the ability of the wealth manager to act without having to obtain the client’s approval. Full discretion means that the wealth manager is free to implement rebalancing trades and replace fund managers without prior client approval. If the client has given the wealth manager discretion over certain changes (e.g., rebalancing), this section of the IPS

should reflect that arrangement. The wealth manager operating in a non-discretionary capacity makes recommendations to the client but is not able to implement a recommendation without client consent.

5.1.4.2 Rebalancing This section explains the wealth manager's rebalancing methodology. Some wealth managers use a "time-based" rebalancing policy, whereby client portfolios are rebalanced at a certain time interval (e.g., quarterly or annually) regardless of the difference between current asset class weights and target asset class weights. It is more common for wealth managers to use a "threshold-based" rebalancing policy, whereby the manager initiates rebalancing trades when asset class weights deviate from their target weights by a pre-specified percentage. The rebalancing section also sets expectations for how frequently the wealth manager reviews a client's portfolio for possible rebalancing opportunities.

5.1.4.3 Tactical Changes A wealth manager who periodically makes tactical changes (adjustments) to the client's asset allocation establishes the parameters for implementing such changes in this section of the IPS. If target allocation ranges have been established in the portfolio asset allocation section, this section indicates whether—as well as under what circumstances and to what degree—the wealth manager is permitted to go outside those ranges when executing a tactical change. Note that a wealth manager who uses only a strategic asset allocation approach would likely not include this section in the IPS.

5.1.4.4 Implementation This section includes information about the investment vehicles the wealth manager recommends to clients. Among the issues discussed here is whether the wealth manager recommends the exclusive use of third-party money managers, the exclusive use of proprietary investment offerings (those managed within the wealth manager's firm), or some combination of the two approaches. Also, this section indicates whether the wealth manager prefers to invest in mutual funds, exchange-traded funds (ETFs), or individual securities. A general discussion of the incremental cost of using third-party money managers is relevant here.

With respect to third-party managers, this section should include basic information about the wealth manager's due diligence process and how frequently it is performed. A more detailed option involves listing the quantitative screens used in the due diligence process and the qualitative criteria that influence the manager selection and retention decisions.

5.1.5 Duties and Responsibilities

This section discusses the wealth manager's overall responsibilities, including expectations about the ongoing review of a client's IPS.

5.1.5.1 Wealth Manager Responsibilities A list of responsibilities helps the client understand how the wealth manager operates in helping the client reach his investment objectives. The wealth manager typically addresses the following issues (where applicable):

- Developing an appropriate asset allocation
- Recommending or selecting investment options, such as pooled investment vehicles or individual securities
- Monitoring the asset allocation and rebalancing
- Using derivatives, leverage, short sales, and repurchase agreements (repos)
- Monitoring the costs associated with implementing the investment strategy
- Monitoring the activities of third-party service providers (e.g., asset managers and/or custodians)
- Drafting and maintaining the IPS

- Reporting of performance, including an indication of the base currency
- Reporting of taxes and financial statements
- Voting proxies
- Assisting with the preparation of agreements associated with private fund offerings

The wealth manager might also consider listing the responsibilities of third-party service providers. A custodian, for example, maintains segregated client accounts, values the investment assets, collects income, and settles transactions. Listing the custodian's responsibilities separately creates an opportunity to educate the client about this provider's distinct and important role.

5.1.5.2 IPS Review The wealth manager sets expectations for how frequently the client and wealth manager will review the IPS. As part of this review, it is important for the client to affirm that the investment objectives remain accurate. Likewise, it is important for the wealth manager to confirm that the strategy remains likely to meet those objectives.

5.1.6 IPS Appendix

The appendix includes additional details that typically change more frequently than the main portion of the IPS. Below are two examples of items that may be included in the appendix.

5.1.6.1 Modeled Portfolio Behavior Modeled portfolio behavior describes a range of possible performance outcomes over various holding periods and can provide more value to the client than merely stating the return objective or the “expected compound return.” As part of this section, the wealth manager may provide a modeled distribution of returns at various percentile ranges. The median of the modeled return distribution may be termed the “modeled compound return.” This approach also enables the wealth manager to present modeled portfolio downside risk (volatility), particularly for short periods, and to confirm that the client can withstand such an outcome.

5.1.6.2 Capital Market Expectations Capital market expectations include the wealth manager's modeled portfolio statistics—that is, the expected returns and standard deviations of asset classes, as well as modeled correlations between asset classes. Because clients sometimes confuse expected return (i.e., simple average return) with compound annual return, the wealth manager may consider including the modeled compound annual return for each asset class.

5.2 Sample Investment Policy Statement for a Private Client

Exhibit 5 demonstrates a sample IPS for a fictitious private client couple, David and Amelia King. The Kings' wealth manager does not use a tactical asset allocation approach for the couple, so the section on tactical changes is not relevant in this case.

Exhibit 5 Sample Investment Policy Statement

Investment Policy Statement Prepared for David and Amelia King

Background and Investment Objectives

This Investment Policy Statement (IPS) is designed to assist David and Amelia in meeting their financial objectives. It contains a summation of their objectives and expectations, sets forth an investment structure for attaining these objectives, and outlines ongoing responsibilities.

The purpose of this portfolio is to support the continuation of David and Amelia's current lifestyle, provide for their family's needs, and fund their philanthropic objectives. Maintenance of their current lifestyle is their primary objective, followed by support for family members and charitable aspirations, in that order. To meet these objectives, they anticipate needing approximately \$350,000 per year in inflation-adjusted portfolio distributions. In addition, they intend to purchase a second residence within the next two years. They expect the purchase price for the second residence to be approximately \$1.5 million. David and Amelia have not articulated a specific dollar amount that they intend to leave to their children, nor a specific dollar amount that they wish to leave to charity at their death. The wealth manager will continue to work with them to quantify these objectives.

In establishing their asset allocation, David and Amelia have considered their current assets and expected cash needs. They are seeking to achieve a higher long-term rate of return and are willing to assume the associated portfolio volatility.

Portfolio Accounts

Taxable joint account for David and Amelia
Tax-deferred account for David
Tax-deferred account for Amelia

Current Combined Market Value

\$12,250,000

Investment Parameters

Risk Tolerance

The wealth manager has determined that David and Amelia are able and willing to withstand short- and intermediate-term portfolio volatility. They recognize and acknowledge the anticipated level of portfolio volatility associated with their asset allocation (as illustrated in the Modeled Portfolio Behavior section of the Appendix).

Investment Time Horizon

David and Amelia have an investment time horizon that exceeds 15 years.

Asset Class Preferences

The Kings and their wealth manager have selected the following asset classes:

- Short-term debt investments
- Intermediate-term bonds
- US stocks

(continued)

Exhibit 5 (Continued)

- Non-US stocks
- Global real estate securities

Other Investment Preferences

The Kings wish to maintain their positions in Acme Manufacturing, Inc., which Amelia received through inheritance, and Artful Publishing, Ltd., which is her former employer. Neither position represents significant concentration risk in the context of their broader portfolio.

David has an interest in a private real estate limited partnership that invests primarily in office buildings throughout Asia. The wealth manager has taken this exposure into consideration in designing the broader asset allocation.

Liquidity Preferences

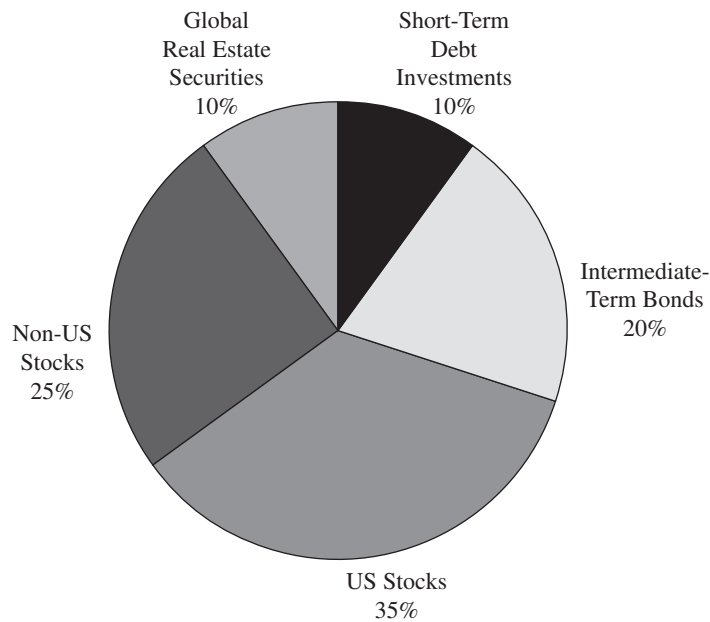
David and Amelia wish to maintain within their portfolio a minimum cash balance of \$50,000. They typically maintain a more sizable cash balance at their primary bank.

Constraints

Amelia's position in Artful Publishing, Ltd., has significant embedded capital gains.

Portfolio Asset Allocation

	Lower Rebalancing Limit	Strategic Allocation	Upper Rebalancing Limit
Short-term debt investments	8%	10%	12%
Intermediate-term bonds	16%	20%	24%
US stocks	30%	35%	40%
Non-US stocks	20%	25%	30%
Global real estate securities	8%	10%	12%



Portfolio Management

Discretionary Authority

The wealth manager will implement discretionary portfolio changes related to rebalancing the portfolio, investing new deposits, and generating liquidity to meet withdrawal requests.

The wealth manager will review with the client, prior to implementation, the addition of new positions or the elimination of existing positions.

Rebalancing

The wealth manager will review the portfolio on at least a monthly basis. Rebalancing will be determined by the lower and upper asset class limits set forth in the Portfolio Asset Allocation section of the IPS.

Implementation

To implement the investment strategy, the wealth manager will utilize third-party money managers via mutual funds, exchange-traded funds (ETFs), and separate accounts of individual securities. The wealth manager conducts a quarterly due diligence process to evaluate recommended managers as well as the universe of other available managers. This process involves quantitative risk and return comparisons to appropriate indexes and peer groups, as well as qualitative assessments of other factors that may impact a manager's ability to perform in the future. More information about this process is available at the client's request.

Duties and Responsibilities

Wealth Manager Responsibilities

The wealth manager is responsible for the following:

- Developing an appropriate asset allocation
- Selecting investment options
- Implementing the agreed-upon strategy
- Monitoring the asset allocation and rebalancing when necessary
- Monitoring the costs associated with implementing the investment strategy
- Monitoring the activities of other service vendors (e.g., custodians)

- Drafting and maintaining the IPS
- Performance reporting
- Tax and financial accounting reporting
- Proxy voting

IPS Review

The client will review this IPS at least annually to determine whether the investment objectives are still accurate. The wealth manager will review this IPS at least annually to evaluate the continued feasibility of achieving the client's investment objectives.

IPS Appendix

Modeled Portfolio Behavior⁵

Modeled Compound Return: 6.23%

Modeled Distribution of Returns

Year	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile
1	-10.45	-2.89	6.23	16.21	26.01
3	-3.75	0.86	6.23	11.88	17.24
5	-1.58	2.05	6.23	10.58	14.66
10	0.64	3.25	6.23	9.29	12.12
15	1.65	3.79	6.23	8.72	11.02
25	2.66	4.34	6.23	8.15	9.92

Portfolio downside risk, 1-year horizon:

- 25% likelihood of a return less than -2.89%
- 10% likelihood of a return less than -10.45%

Portfolio downside risk, 15-year horizon:

- 25% likelihood of a compound annual return less than 3.79%
- 10% likelihood of a compound annual return less than 1.65%

Capital Market Assumptions

Modeled Portfolio Statistics

	Expected Return (%)	Standard Deviation (%)	Modeled Compound Return (%)
Short-term debt investments	2.5	2.0	2.5
Intermediate-term bonds	3.5	8.0	3.2

⁵ The modeled returns and risk projections are based on forward-looking estimates and not on the past performance of specific funds or indexes. Modeled returns are before taxes and do not reflect investment management fees.

(Continued)

	Expected Return (%)	Standard Deviation (%)	Modeled Compound Return (%)
US stocks	8.5	22.0	6.1
Non-US stocks	10.0	26.0	6.6
Global real estate securities	7.5	23.0	4.9

Modeled Correlations

	(1)	(2)	(3)	(4)	(5)
1 Short-term debt investments	1.00				
2 Intermediate-term bonds	0.79	1.00			
3 US stocks	−0.08	−0.03	1.00		
4 Non-US stocks	−0.29	−0.27	0.76	1.00	
5 Global real estate securities	−0.15	0.08	0.42	0.39	1.00

PORTFOLIO CONSTRUCTION AND MONITORING

6

The practice of private wealth management involves aligning the unique attributes of the individual investor with the most appropriate investment plan and strategy. In prior sections, we discussed how wealth managers gather, synthesize, and analyze client information and goals/objectives. We now discuss the next phases of constructing the client's portfolio, monitoring the client's investment program, and reporting the portfolio to the client.

6.1 Portfolio Allocation and Investments for Private Wealth Clients

Once the client's IPS is developed, the next step is to implement the IPS through actionable investment advice. Portfolio construction, including asset and investment allocation, is a key aspect of this process. We first discuss two approaches to constructing a private client's portfolio—a traditional approach and a goals-based investing approach.

6.1.1 Portfolio Construction—Traditional Approach

Constructing portfolios for private clients involves several key steps:

- *Identify asset classes.* The wealth manager identifies the asset classes that may be appropriate for the client's portfolio. The identification of asset classes may vary by wealth manager. For instance, one wealth manager may designate "UK Equities" as an asset class, whereas another wealth manager may designate "UK Large-Capitalization Equities" and "UK Small-Capitalization Equities" as separate asset classes.

- *Develop capital market expectations.* The wealth manager considers the expected returns, standard deviations, and correlations of asset classes in relation to the client's investment horizon. Wealth managers typically update their capital market expectations according to changes in the financial market environment.
- *Determine portfolio allocations.* Wealth managers sometimes use mean–variance optimization to identify possible portfolio allocations that meet the client's return requirement and risk tolerance. Mean–variance optimization provides a framework for determining how much to allocate to each asset to maximize the expected return for an expected level of risk. The “optimal” portfolio for a given client is the portfolio that maximizes expected return given the client's degree of risk tolerance. Note that a client's optimal portfolio may contain allocations to certain asset classes that may be impractical or difficult for the client to maintain. Therefore, wealth managers generally apply asset class constraints in the optimization process. For example, the minimum and maximum thresholds for a given asset class might be 0% and 20%, respectively.
- *Assess constraints.* As we noted earlier in the reading, private clients often face certain constraints. For instance, suppose a client has a €5 million investment portfolio, with €2 million of the total portfolio invested in 14 individual stocks in Germany that have appreciated in value considerably. Selling these securities may be prohibitive due to potential taxes on any capital gains in the client's country of domicile. In this situation, the client's wealth manager may specify a minimum threshold for German equities to reflect the embedded capital gains. Another example of a constraint applies when a client owns a considerable amount of residential real estate. In this case, the client's wealth manager may limit the allocation to real estate investment trusts (REITs) in the client's investment portfolio.
- *Implement the portfolio.* At this stage, the wealth manager faces several decisions. One decision is the choice of active management or passive management (e.g., indexing) for each asset class. Once that decision is made, manager selection becomes an important consideration. Another decision for the wealth manager is which factors to recommend within a given asset class. Such factors may include “value” (value stocks over growth stocks) and “size” (small-capitalization stocks over large-capitalization stocks). Implementation also involves a decision to utilize individual securities or pooled vehicles, such as mutual funds and ETFs. Finally, the decision to apply currency hedging can be another important implementation decision.
- *Determine asset location.* When a client's portfolio comprises multiple accounts, the wealth manager must determine where to allocate the various asset classes and securities. This allocation decision is called **asset location**. Generally, tax considerations are a critical factor for asset location. If certain accounts offer unique tax benefits (e.g., tax deferral), the wealth manager will generally allocate to these accounts those investments that will likely produce a meaningful level of taxable income.

Example 10 demonstrates the portfolio construction process for a fictitious wealth manager and private client, ultimately resulting in a recommended allocation of the client's portfolio and underlying investments.

EXAMPLE 10

Portfolio Construction—Traditional Approach

Jonas Wilhelm, CFA, has just added a new private client. In Exhibit 6, Wilhelm identifies appropriate asset classes and develops capital market expectations for the new client's portfolio.

Exhibit 6 Asset Classes and Capital Market Expectations

Asset Class	Expected Return (%)	Standard Deviation (%)
Investment-grade bonds	3.0	3.0
High-yield bonds	4.5	8.0
European equities	9.0	18.0
Global (ex-European) equities	10.0	20.0
Real estate securities	8.5	18.0
Commodities	6.0	20.0

In determining portfolio allocations, Wilhelm developed a correlation matrix of these asset classes, as shown in Exhibit 7.

Exhibit 7 Asset Class Correlation Matrix

	IGB	HYB	EE	GEE	RE	COM
Investment-grade bonds (IGB)	1.00	0.84	−0.04	−0.01	0.14	0.02
High-yield bonds (HYB)	0.84	1.00	0.30	0.35	0.20	−0.04
European equities (EE)	−0.04	0.30	1.00	0.82	0.60	0.17
Global (ex-European) equities (GEE)	−0.01	0.35	0.82	1.00	0.52	0.36
Real estate securities (RE)	0.14	0.20	0.60	0.52	1.00	0.44
Commodities (COM)	0.02	−0.04	0.17	0.36	0.44	1.00

Based on a risk tolerance assessment, Wilhelm determines that the client can accept a portfolio standard deviation of return of approximately 10%. The client has a preference for European equities due to his familiarity with companies in Europe.

Wilhelm performs a mean–variance optimization that produces an optimal asset allocation. As shown in Exhibit 8, he modifies the portfolio allocation according to the client's preferences to arrive at a recommended allocation.

Exhibit 8 Portfolio Allocation

	Portfolio Allocation from Mean-Variance Optimization (%)	Portfolio Allocation Recommendation (%)
Investment-grade bonds (IGB)	30.92	34.00
High-yield bonds (HYB)	10.00	7.00
European equities (EE)	15.74	31.00
Global (ex-European) equities (GEE)	25.00	17.00
Real estate securities (RE)	15.00	8.00
Commodities (COM)	3.34	3.00
	100.00	100.00
Expected Return	6.77	6.69
Standard Deviation	10.00	10.00

6.1.2 Portfolio Construction—Goals-Based Investing Approach

With a **goals-based investing** approach, the wealth manager focuses on aligning investments with goals. That is, the manager identifies the client's goals and assigns the required funds to each goal. The manager then performs mean–variance optimization for each goal “portfolio” rather than at the overall portfolio level. Goal portfolios are optimized either to a stated maximum level of volatility or to a specified probability of success. Therefore, with goals-based investing, the allocation of the overall portfolio is a function of the respective allocations of the individual goal portfolios.

An advantage of the goals-based investing approach is that it may be easier for clients to express their risk tolerance on a goal-specific basis rather than at the overall portfolio level. A disadvantage is that the combination of goal portfolio allocations may not lead to optimal mean–variance efficiency for the entire portfolio. In other words, the aggregation of each goals-based portfolio allocation may not produce a total portfolio allocation that lies along the client's efficient frontier. Example 11 demonstrates how a wealth manager might allocate a client's portfolio using a goals-based investing approach.

It should be noted that the remaining steps of the portfolio construction process discussed previously—identifying asset classes, implementing the portfolio, and determining asset location—are the same for both the goals-based investing approach and the traditional approach.

EXAMPLE 11**Portfolio Allocation—Goals-Based Investing Approach**

Using the information from Example 10, suppose that Jonas Wilhelm's client has two primary goals: (1) purchasing a ski cottage within the next 7 years and (2) supplementing his retirement income over the next 30 years. His total portfolio is valued at €3.1 million. The client will need approximately €500,000 for the ski cottage and desires low volatility for this goal.

If Wilhelm used a goals-based investing approach, his client's portfolio allocation might look like the example shown in Exhibit 9.

Exhibit 9 Portfolio Allocation—Goals-Based Investing

	Allocation in Ski Cottage Portfolio (%)	Allocation in Retirement Portfolio (%)	Aggregate Portfolio Allocation (%)
Investment-grade bonds (IGB)	70.00	27.00	34.00
High-yield bonds (HYB)	8.00	7.00	7.00
European equities (EE)	12.00	35.00	31.00
Global (ex-European) equities (GEE)	5.00	19.00	17.00
Real estate securities (RE)	3.00	9.00	8.00
Commodities (COM)	2.00	3.00	3.00
	100.00	100.00	100.00
Expected Return	4.42	7.12	6.69
Standard Deviation	4.56	11.15	10.00

The advantage of a goals-based approach in this case is that the client can express his expected return and risk tolerance with respect to the ski cottage goal.

6.2 Portfolio Reporting and Review

Portfolio reporting and portfolio review enable wealth managers to share information with clients, shape clients' expectations, and provide ongoing education. *Portfolio reporting* involves delivering information about their investment portfolio and performance in periodic physical or electronic mailings. *Portfolio review* refers to meetings or phone conversations between a wealth manager and a client to discuss the client's investment strategy. The key difference between portfolio reporting and portfolio review is that the wealth manager is more actively engaged with a review.

6.2.1 Portfolio Reporting

Typically, a portfolio report answers several questions, including, what is the portfolio asset allocation? how has the portfolio performed? and what transactions have occurred in the portfolio, such as contributions, withdrawals, interest/dividends, and capital appreciation? Accordingly, a portfolio report usually includes the following:

- A portfolio asset allocation report, which may reflect strategic asset allocation targets
- A performance summary report for the current (often year-to-date) period
- A detailed performance report, which may include asset class and/or individual security performance
- A historical performance report covering the period since the inception of the client's investment strategy
- A contribution and withdrawal report for the current period
- A purchase and sale report for the current period
- A currency exposure report detailing the effects of exchange rate fluctuations

A sample portfolio asset allocation report, performance summary report, and asset class performance report for the fictitious private client Hong Soo Wan are shown in Exhibit 10, Exhibit 11, and Exhibit 12, respectively.

Exhibit 10 Sample Portfolio Asset Allocation Report

Hong Soo Wan
Portfolio Asset Allocation Report
31 December 20XX

Asset Class	Market Value	Allocation	Target Allocation
Public fixed income	CNY 26,918,882	18.95%	20.00%
Private fixed income	CNY 4,109,563	2.89%	5.00%
Public equities	CNY 61,850,957	43.55%	41.00%
Private equities	CNY 18,233,357	12.84%	12.00%
Private real estate	CNY 21,008,677	14.79%	12.00%
Private natural resources	CNY 4,688,032	3.30%	5.00%
Hedge funds	CNY 5,222,597	3.68%	5.00%
Total Portfolio	CNY 142,032,065	100.00%	100.00%

Exhibit 11 Sample Performance Summary Report

Hong Soo Wan
Portfolio Summary Report
31 December 20XX

Beginning Portfolio Value	CNY 136,928,682
Contributions	CNY 0
Withdrawals	(CNY 2,130,481)
Interest and Dividends	CNY 2,840,641
Capital Appreciation	CNY 4,393,223
Ending Portfolio Value	CNY 142,032,065
Total Investment Gain	CNY 7,233,864
Time-Weighted Rate of Return	5.31%

Exhibit 12 Sample Asset Class Performance Report

Hong Soo Wan
Asset Class Performance Report
31 December 20XX

Exhibit 12 (Continued)

Asset Class	Allocation	Return for Period
Public fixed income	18.95%	2.71%
Private fixed income	2.89%	5.24%
Public equities	43.55%	5.72%
Private equities	12.84%	9.81%
Private real estate	14.79%	5.60%
Private natural resources	3.30%	(1.42%)
Hedge funds	3.68%	2.79%
Total Portfolio	100.00%	5.31%

For private clients, portfolio reports may lack some necessary context, such as commentary on recent economic and financial events or on the overall performance of asset classes. As a result, wealth managers often send an accompanying letter (or email) to clients with the portfolio report. This letter supplies some of the missing investment context and represents an opportunity for the wealth manager to provide education and advice.

Wealth managers often face an inherent conflict between the client's investment horizon, which may be decades in length, and the typical performance evaluation horizon, which may be one calendar quarter or one year. This horizon mismatch can potentially undermine long-term investment decision making. For instance, short-term volatility can be mistaken for signs that a client's long-term strategy is not effective. With the expanded use of technology by clients (e.g., electronic report delivery and instant access to portfolio information), it is increasingly critical for wealth managers to appropriately communicate performance information to clients and manage their expectations.

When goals-based investing is used, portfolio reporting may focus on the client's progress toward a goal (or goals) rather than on the (often short-term) performance of asset classes or individual securities. For example, if a client has two different portfolios dedicated to two separate goals, a wealth manager's report may include the progress toward each of the goals based upon a capital sufficiency analysis.

Benchmark reports are another component of portfolio reporting. In a typical benchmark report, a wealth manager states a client's performance by asset class relative to an appropriate asset class benchmark, as well as the client's overall portfolio performance relative to a blended benchmark (according to asset class weighting). An advantage of benchmark reporting is the additional context that it provides to clients.

EXAMPLE 12

Portfolio Reporting

Simon Crosby provides investment advice for clients in Canada. Each quarter, he sends his clients only a detailed list of all the investments in their portfolio. The list includes the acquisition cost, the acquisition date, and the current market value for each investment, as well as the percentage gain or loss on each investment relative to its cost.

Discuss how Crosby's reporting practice can be more effective.

Solution:

Crosby's reports do not enable his clients to determine their asset allocation or the performance of their overall portfolios. Crosby could address this issue by including a portfolio asset allocation report and a performance report. The current reporting structure also does not provide transaction details, such as portfolio contributions, withdrawals, interest/dividends, and capital appreciation, all of which could be provided by a portfolio summary report. Finally, Crosby's portfolio reporting can be improved by including market commentary, typically in a letter or email.

6.2.2 Portfolio Review

In comparison to portfolio reporting, portfolio reviews represent a higher level of engagement between the wealth manager and the client. Portfolio reviews provide an opportunity for the wealth manager to revisit the client's investment plan and reinforce the appropriateness of the strategy. The wealth manager can use these reviews to deepen the client's knowledge of the portfolio as well as to set and update expectations for the wealth manager's own responsibilities.

As part of the portfolio review, the wealth manager typically inquires about any changes in the client's objectives, risk tolerance, or time horizon. Changes in the client's employment, liquidity needs, family needs, external sources of cash flow, and estate planning can also result in changes to the client's investment strategy.

Another common aspect of a portfolio review is a comparison of the client's asset allocation to the target allocation. The following are some questions a wealth manager may consider: Should the portfolio be rebalanced? Are the client's asset class weights within the prescribed range for each asset class? Should there be any asset class adjustments? And what factors should influence tactical asset class positioning? Investment manager performance, relative to both applicable benchmarks and peers, is often discussed during portfolio reviews.

Wealth managers typically document the key points (or takeaways) from their portfolio reviews with clients. To maintain these notes, managers often use CRM software. Providing written communication to the client that reaffirms points from the meeting is also common practice. This communication can help avoid future misunderstandings and client disappointment.

6.3 Evaluating the Success of an Investment Program

Evaluating the success of an investment program in private wealth management is distinct from—and often more complex than—evaluating an investment program in the context of traditional asset (i.e., fund) management. For example, assume an asset management firm manages an emerging market stock fund. Evaluating the success of this fund would likely include comparing the fund's performance to that of an emerging market stock index over a representative holding period. The success or failure of this fund may be straightforward. In contrast, for private clients, portfolio performance, though important, is only part of the evaluation process.

6.3.1 Goal Achievement

A successful investment program for a private client is one that achieves the client's goals/objectives with an acceptable amount of risk. A private client's investment program is typically ongoing rather than short-term in nature. Therefore, the relevant question is not whether the investment strategy has succeeded for the client during a particular period, but whether the investment strategy remains likely to succeed

in the future by achieving the client's longer-term goals. Capital sufficiency analysis, which we discussed earlier in the reading, is often used to determine whether the client remains likely to meet his or her objectives.

Another aspect of a successful investment program is that the client should remain likely to meet his or her objectives without meaningful adjustments to the plan. For instance, if clients must work for many years beyond their original intended retirement date or must drastically reduce their retirement lifestyle, the existing investment program has not achieved its original objective.

6.3.2 Process Consistency

Following a consistent process is crucial to ensuring the overall success of the client's investment program. The following are some points that wealth managers may consider in evaluating success:

- If the wealth manager selects third-party fund managers to implement the client's portfolio, how have the managers performed relative to their own benchmarks? When the wealth manager has recommended fund manager changes, have those changes improved or detracted from subsequent portfolio performance?
- Has the wealth manager followed the prescribed process for rebalancing the client's portfolio?
- Has the wealth manager taken steps to reduce costs in the client's portfolio? Is the wealth manager overlooking any opportunities to reduce fees and expenses?
- Has the wealth manager considered taxation issues in the client's portfolio?
- For clients with ESG preferences, has the wealth manager implemented the client's portfolio strategy accordingly?
- If the wealth manager uses tactical asset allocation, how has tactical positioning impacted the portfolio's performance?
- Is the wealth manager maintaining an ongoing dialogue with the client to assess potential changes in the client's goals, time horizon, risk tolerance, and other relevant factors?
- Where applicable, has the wealth manager coordinated the investment strategy with the client's estate plan and philanthropic objectives?

6.3.3 Portfolio Performance

Performance evaluation of a private client's portfolio can be expressed in either absolute or relative terms. An absolute performance benchmark might be inflation plus a fixed percentage or simply a fixed percentage return that relates to a client's capital sufficiency analysis. Generally, these absolute performance benchmarks apply to relatively long holding periods, such as five or more years.

To measure relative returns, a wealth manager compares the client's investment portfolio results to those of an appropriately weighted benchmark. Typically, the benchmark weights include both return and risk metrics. A more useful comparison for a private client's portfolio is the relative risk-adjusted return. It is also important to evaluate whether the portfolio's actual downside risk is consistent with the client's risk tolerance. Many private clients tend to compare their own portfolio's performance to the performance of the investments with which they are most familiar, such as their home country's stock index. This tendency is an important consideration for wealth managers in the portfolio construction process and when communicating performance to clients.

6.3.4 Definitions of Success

When the wealth manager and the client have different definitions of success for the client's investment program, the potential for client disappointment can increase. For example, the client's definition of success may be achieving superior relative returns or attaining a particular absolute return. However, the wealth manager's definition of success for the client may be achieving certain financial goals. It is good practice for both parties to agree on the definition of success in the early stages of the relationship. Generally speaking, it is the wealth manager's responsibility to initiate a conversation with a client about how the success of the investment program will be evaluated.

EXAMPLE 13

Evaluating the Success of an Investment Program

Oliver Wellesley, CFA, a wealth manager, is preparing to meet with a longtime client, Eva Smith, age 83. Wellesley and Smith began working together when Smith was 64 and preparing for her retirement. She has earned a 6.5% compound annual return with Wellesley as her wealth manager. This return is close to the annual return that Wellesley modeled in his capital sufficiency analysis of Smith's portfolio many years ago. Distributions from Smith's portfolio have adequately met her need for retirement income, which has always been her highest-priority goal. According to Wellesley's most recent capital sufficiency analysis, Smith's portfolio is very likely to meet her retirement income and estate bequest objectives in the future. However, Smith's investment return has trailed the weighted benchmark return by 0.40% since the portfolio's inception and has exhibited slightly more volatility than the benchmark. Smith recently reviewed her IPS and concluded that Wellesley has consistently followed the process outlined in the IPS.

Discuss how successful Smith's investment program has been under Wellesley's management.

Solution:

From the perspective of meeting goals/objectives, Smith's investment program has been successful. The strategy has met her retirement income needs, and Wellesley's capital sufficiency analysis suggests that she has a high probability of achieving future objectives (including ongoing retirement lifestyle goals and an estate bequest goal). Also, Wellesley has followed a consistent process, which is an indication of a successful investment program. However, if Smith and Wellesley agreed that outperforming a weighted benchmark was an important goal for her investment strategy, then the investment program has failed.

7

ETHICAL AND COMPLIANCE CONSIDERATIONS IN PRIVATE WEALTH MANAGEMENT

Like other investment practitioners, private wealth managers face many ethical and compliance issues. Some issues, however, are unique to the practice of private wealth management. In this section, we provide a brief overview of ethical and compliance considerations for private wealth managers. We then discuss the different client segments and service offerings within private wealth management.

7.1 Ethical Considerations

A starting point for ethical considerations in private wealth management is the CFA Institute Code of Ethics and Standards of Professional Conduct (Code and Standards). In this section, we discuss ethical considerations that are particularly relevant to private wealth management.

7.1.1 *Fiduciary Duty and Suitability*

In private wealth management, two primary ethical concepts are *fiduciary duty* and *suitability*. Fiduciary duty is the obligation to deliver a high standard of care when acting for the benefit of another party. Accordingly, private wealth managers are often said to be operating under a “fiduciary standard.” Suitability is a key element of a wealth manager’s fiduciary duty. According to the Code and Standards, when judging the suitability of a potential investment, the wealth manager should review many aspects of the client’s knowledge, investing experience, and financial situation. The concepts of fiduciary duty and suitability are relevant to several components of the Code and Standards, including *Standard I(B): Independence and Objectivity*; *Standard III(A): Loyalty, Prudence, and Care*; *Standard III(C): Suitability*; and *Standard V(A): Diligence and Reasonable Basis*.

7.1.2 *Know Your Customer (KYC)*

The concept of “Know Your Customer” (KYC) applies globally in private wealth management. KYC requires wealth managers and their firms to obtain essential facts about every client for whom they open and maintain an account. These facts include the client’s risk and return objectives and the origin of the client’s wealth, which may help in identifying problems such as money laundering. KYC guidelines continue to evolve and can vary depending upon the country/region. The concept of KYC is relevant to *Standard III(C): Suitability* in the Code and Standards.

7.1.3 *Confidentiality*

Preserving client confidentiality is critical to maintaining trust in the relationship. Wealth managers typically possess highly personal and sensitive client information. This issue can be a particular challenge when a wealth manager advises multiple family members or advises clients who may know one or more of the wealth manager’s other clients. Changes in electronic communication standards require wealth managers to have a thorough understanding of the confidentiality policies of their employers. Overall, the concept of confidentiality is relevant to *Standard III(E): Preservation of Confidentiality*.

7.1.4 *Conflicts of Interest*

The structure of wealth managers’ revenue creates the potential for conflicts of interest. For example, when wealth managers earn commissions for recommending certain investment products, there may be an incentive to recommend only products that generate commissions (and perhaps those with the highest commissions). Conflicts of interest may also occur when wealth managers are subject to fee-based revenue models. For example, wealth managers who earn a percentage of the client’s assets under management may have an incentive to recommend that the client not withdraw assets from the portfolio. The concept of conflicts of interest is relevant to *Standard I(B): Independence and Objectivity* and *Standard VI: Conflicts of Interest*.

EXAMPLE 14**Ethical Considerations in Private Wealth Management**

Shirley Marshall wants to purchase a new home. She asks her wealth manager whether she should (1) obtain a mortgage loan to acquire the home or (2) withdraw money from her portfolio to purchase the home with cash.

Discuss potential ethical considerations for Marshall's wealth manager.

Solution:

A conflict of interest could exist if the wealth manager earns revenues based on a percentage of Marshall's assets under management. If Marshall elects to withdraw money from her portfolio to purchase the home, her assets under management with the wealth manager will decline (all other things being equal), resulting in a lower fee for the wealth manager. In this case, the wealth manager should analyze the decision objectively and disclose this potential conflict of interest to the client.

7.2 Compliance Considerations

Changes in the regulatory environment have relevance to private wealth management. Exhibit 13 summarizes some globally enacted regulations relating to compliance.

In the United States, two additional proposed regulations are relevant for wealth managers. Both the US Department of Labor Fiduciary Rule (Fiduciary Rule) and the Securities and Exchange Commission Best Interest Rule (Best Interest Rule) seek to enhance investor protection. The Fiduciary Rule would expand the definition of fiduciary to all professionals providing advice for retirement plans and IRAs (Individual Retirement Accounts). The Best Interest Rule would require a broker/dealer to act in the best interest of the investor and would restrict certain broker/dealers and their employees from using the term "advisor" or "adviser" as part of their title. As of the publication of this reading, neither of these rules has been enacted.

Exhibit 13 Key Compliance Regulations

Regulation	Summary
Markets in Financial Instruments Directive (MiFID II, European Union, 2018)	Designed to improve investor protection, market structure and transparency, firm governance, and external controls. Several of the investor protection provisions are of particular relevance to advisors. Investment advisors must demonstrate the suitability of their advice, including how it will meet client objectives, and must meet minimum levels of professional competence. Also, independent advisors and discretionary portfolio managers will no longer be permitted to receive commissions.
Common Reporting Standard (OECD Council/G20, 2014)	Requests that jurisdictions obtain information from their financial institutions and automatically exchange such information with other jurisdictions on an annual basis.

Exhibit 13 (Continued)

Regulation	Summary
The Foreign Account Tax Compliance Act (FATCA, United States, 2010)	Enacted to prevent tax evasion by US individuals who hold “offshore” accounts and other financial assets. The rule requires non-US financial institutions to report information about financial accounts held by US taxpayers or by non-US entities in which US taxpayers hold a substantial ownership interest.

PRIVATE CLIENT SEGMENTS

8

The level of wealth varies considerably among private clients. Exhibit 14 provides a global breakdown of the number of adults within specific wealth ranges. Perhaps not surprisingly, the vast majority of individuals are in lower wealth ranges.

Exhibit 14 Private Wealth Composition

Wealth Range (\$ millions)	Number of Adults Globally (millions)
0.1 – 1.0	391.0
1.0 – 5.0	31.4
5.0 – 10.0	3.0
10.0 – 50.0	1.5
> 50.0	0.1

Source: Credit Suisse (2017).

On a geographic basis, the majority of adults with wealth in the \$100,000 to \$1 million range are in Europe (37% of the total wealth range) and the Asia-Pacific region (36%). In higher ranges, notably among those with wealth exceeding \$1 million, the number of adults is more concentrated in the United States. While the United States has the highest proportion in this wealth segment, growth in the number of millionaire investors has been faster in emerging market economies.

The variation in global wealth ranges has implications for the issues private clients face and the services they require. Accordingly, private wealth management firms typically organize their services depending on the private client segment(s) they serve. In this section, we discuss key client segments and the services and solutions that clients within these segments may desire.

8.1 Mass Affluent Segment

The mass affluent segment is generally focused on building their investment portfolio and may have financial planning needs (e.g., education funding, cash flow or budget management, and risk management). Risk management needs may relate to future sources of income and may result in the need for various forms of insurance. Older clients in this segment tend to have a focus on retirement planning and investing for a secure retirement.

In servicing the mass affluent segment, wealth managers do not typically customize their investment management approach for each client. This segment tends to have a higher number of clients per wealth manager and involves a greater use of technology in service delivery (i.e., information gathering, account establishment, and reporting). Revenue models in this segment range from a traditional brokerage model (whereby the client is charged a commission on investment transactions) to a fee-only model (whereby the client is charged a percentage of assets under management for discretionary portfolio management). **Discretionary portfolio management** refers to an arrangement in which the wealth manager has a client's pre-approval to execute investment decisions. This arrangement is similar to the concept of discretionary authority discussed earlier in the reading. By contrast, non-discretionary portfolio management refers to an arrangement in which the wealth manager makes recommendations to the client and seeks the client's approval prior to implementation.

8.2 High-Net-Worth Segment

Wealth managers that focus on the high-net-worth segment typically have a lower client-to-manager ratio than those that focus on the mass affluent segment. Also, wealth managers of high-net-worth clients tend to focus on customized investment management, tax planning, and wealth transfer issues (i.e., estate planning). Wealth transfer issues may lead to a longer investment time horizon and greater risk capacity (though not necessarily greater risk tolerance). The higher wealth levels of this segment may also lead to investment in less liquid asset classes and more sophisticated portfolios that require stronger product knowledge on the part of the wealth manager.

8.3 Ultra-High-Net-Worth Segment

The ultra-high-net-worth segment tends to have multi-generational time horizons, highly complex tax and estate-planning considerations, and a wider range of service needs. As a result, firms that represent this segment have relatively few clients per wealth manager.

Additional services may be provided to this segment, such as bill payment services, concierge services, travel planning, and advice on acquiring assets such as artwork or aircraft. Wealth managers focused on this segment often manage accounts for multiple family members and therefore also deal with family governance issues, such as preparing the client's heirs for the inheritance of substantial wealth. Wealth managers in this segment may assemble teams of service providers with specialized and complementary skills. For instance, firms may include specialized tax advisors, legal advisors, investment specialists, and a relationship manager (RM) as members of a client relationship team. Some ultra-high-net-worth individuals choose to hire these specialized experts to work exclusively for themselves and their family members. This arrangement is referred to as a "family office."

EXAMPLE 15

Client Segments

Olivia and her husband, Charles, recently hired a new wealth manager because (1) their financial needs have changed and (2) they felt that their former wealth manager had far too many clients to provide them with customized service. Olivia and Charles are interested in more sophisticated tax planning and more

exposure to alternative investments. They are still concerned about having sufficient assets for their lifetime, but they are much more confident than they were several years ago.

Describe how Olivia and Charles shifted client segments upon the hiring of the new wealth manager.

Solution:

Prior to hiring the new wealth manager, Olivia and Charles were likely in the mass affluent segment, given their previous wealth manager's high number of clients and lack of customized service. As their financial needs changed and they desired more customized service, Olivia and Charles likely moved to the high-net-worth segment. Their new focus on tax planning and alternative investments is also evidence of a shift to the high-net-worth segment. Because the couple are still concerned about having sufficient assets for their lifetime, they likely are not in the ultra-high-net-worth category.

8.4 Robo-Advisors

Amid the rapid growth of financial technology, a trend in private wealth management is the robo-advisor. The term *robo-advisor* applies to wealth management service providers that have a primarily digital client interface and experience. Robo-advisors gather information—such as risk tolerance, time horizon, goals/objectives, assets, and liabilities—directly from the client via web-based questionnaires. Using mean-variance optimization or other techniques, the robo-advisor recommends a suitable asset allocation for the client and typically implements the investment strategy using exchange-traded funds or mutual funds. The processes that robo-advisors use in information gathering and portfolio optimization can be quite similar to those utilized by human advisors. However, the primary distinction is in the digital interface.

Robo-advisors monitor and manage client portfolios on an ongoing basis and periodically rebalance portfolios as needed. Robo-advisors also provide regular reporting to clients through online applications and may make human wealth managers available to handle certain client inquiries. Cost is a key factor that differentiates robo-advisors from human wealth managers. Robo-advisor services are generally available at a cost that is lower than the fees charged by traditional wealth management firms. Scalability of technology has enabled robo-advisors to service investors with relatively small portfolios.

Robo-advisors have expanded their services to various areas of private wealth management—for example, constructing ESG-related portfolios. Other robo-advisors have focused on investor behavior (e.g., encouraging saving or discouraging a reaction to declining securities prices), on factor investing, and on more sophisticated techniques to improve tax efficiency. While many robo-advisors compete directly with traditional wealth management firms, others have partnered with these firms. Such partnerships can enable firms to lower fees or to offer services to clients they might not otherwise have been able to serve.

SUMMARY

- Private clients and institutional clients have different concerns, primarily relating to investment objectives and constraints, investment governance, investment sophistication, regulation, and the uniqueness of individuals.

- Information needed in advising private clients includes personal information, financial information, and tax considerations.
- Basic tax strategies for private clients include tax avoidance, tax reduction, and tax deferral.
- A client's planned goals are those that can be reasonably estimated or quantified within an expected time horizon, such as retirement, specific purchases, education, family events, wealth transfer, and philanthropy.
- Unplanned goals are those related to unforeseen financial needs, such as property repairs and medical expenses.
- When establishing client goals, private wealth managers consider goal quantification, goal prioritization, and goal changes.
- Risk tolerance refers to the level of risk an individual is willing and able to bear. Risk tolerance is the inverse of risk aversion. Risk capacity is the ability to accept financial risk. Risk perception is an individual's subjective assessment of the risk involved in an investment decision's outcome.
- Wealth managers often utilize questionnaires to assess clients' risk tolerance. The result of a risk tolerance questionnaire, typically a numerical score, is often used as an input in the investment planning process.
- Wealth managers need both technical skills and non-technical ("soft") skills in their advisory roles. Technical skills include capital markets proficiency, portfolio construction ability, financial planning knowledge, quantitative skills, technology skills, and in some situations, foreign language fluency. Soft skills include communication skills, social skills, education/coaching skills, and business development and sales skills.
- Capital sufficiency analysis, also known as capital needs analysis, is the process by which a wealth manager determines whether a client has, or is likely to accumulate, sufficient financial resources to meet his or her objectives.
- Two methods for evaluating capital sufficiency are deterministic forecasting and Monte Carlo simulation.
- Wealth managers use several different methods to analyze a client's retirement goals, including mortality tables, annuities, and Monte Carlo simulation.
- An investment policy statement (IPS) for an individual includes the following parts: background and investment objective(s); investment parameters (risk tolerance and investment time horizon); asset class preferences; other investment preferences (liquidity and constraints); portfolio asset allocation; portfolio management (discretionary authority, rebalancing, tactical changes, implementation); duties and responsibilities; and an appendix for additional details.
- Two primary approaches to constructing a client portfolio are a traditional approach and a goals-based investing approach.
- Portfolio reporting involves periodically providing clients with information about their investment portfolio and performance. Portfolio review refers to meetings or phone conversations between a wealth manager and a client to discuss the client's investment strategy. The key difference between portfolio reporting and portfolio review is that the wealth manager is more actively engaged in a review.
- The success of an investment program involves achieving client goals, following a consistent process, and realizing favorable portfolio performance.
- Ethical considerations for private wealth managers include "know your customer" (KYC), fiduciary duty and suitability, confidentiality, and conflicts of interest.

- Several global regulations have relevance for private wealth managers.
- Key private wealth segments include mass affluent, high net worth, and ultra high net worth.
- Robo-advisors have emerged in the mass affluent client segment. These advisors have a primarily digital client interface. Robo-advisor service providers generally charge lower fees than traditional wealth management firms. Scalability of technology has enabled robo-advisors to service investors with relatively small portfolios.

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PRACTICE PROBLEMS

The following information relates to Questions 1–3

Henlopen McZhao is a private wealth manager. After a successful introductory meeting with Nescopeck Cree, she is meeting again with this new client to plan a wealth management strategy. McZhao seeks additional personal information from Cree.

McZhao learns that Cree is 45 years old and is currently employed as an attorney. Cree has a number of specific financial goals that he wishes to achieve in the future but has no particular return objective for his portfolio. Because he has been investing for 20 years, Cree is comfortable with moderate levels of market volatility. His employment provides for his current expenses, so Cree's liquidity requirements are minimal. Cree prefers to have his environmental and social concerns reflected in his investment choices.

- 1 **Discuss** additional personal information that McZhao should gather from Cree in order to properly advise this new client.

McZhao then focuses on Cree's financial goals:

- Cree wants to fund university expenses for his three children, with the first payment starting in 10 years. Cree does not know what to expect in terms of college costs.
- Cree plans to retire at age 62 and expects to need \$80,000 per year to fund his retirement lifestyle. He is concerned that an increasing level of medical expenses for himself and his wife may reduce his financial assets.
- Cree expects to purchase an apartment building in three years and plans to use the rental income from this investment property to help fund his retirement needs.
- Cree's wife enjoys donating to philanthropic causes. She currently donates \$10,000 per year, but by the time Cree retires, she hopes to increase this amount to \$30,000 per year.
- Cree collects antique furniture and budgets \$15,000 per year for additions to his collection. He mentions that this year's antique purchase will be his next large expense and currently has the highest priority of all his goals.

- 2 **Discuss** the issues relating to Cree's:
 - i. goal quantification.
 - ii. goal prioritization.

McZhao continues the discussion with Cree in order to evaluate his degree of risk tolerance associated with each of the following individual goals:

Retirement:	Cree considers retirement a long-term goal and is willing to endure a 10% drop in expected retirement spending. However, he is very concerned with having sufficient funds to cover medical expenses.
Investment property:	Cree sees the investment property as a source of stable income, so it is very important to him to purchase the building. He realizes that maintenance and repair expenses will be necessary, and he also considers those very important.
Philanthropy:	Cree's wife strongly influences him to fund her philanthropic causes, and he wants to maintain some level of annual contribution. Cree believes that his wife would be willing to maintain her \$10,000 per year contributions and not increase that amount.
Antique furniture:	Cree is willing to reduce or eliminate his spending on antique furniture.

- 3 **Determine** Cree's degree of risk tolerance associated with each of the following individual goals. **Justify** each response.

Determine Cree's degree of risk tolerance associated with each of the following individual goals. Justify each response.

Goal	Degree of Risk Tolerance	Justification
Retirement	Lower	
	Higher	
Investment Property	Lower	
	Higher	
Philanthropy	Lower	
	Higher	
Antique Furniture	Lower	
	Higher	

The following information relates to Questions 4–6

Sharfepto Zik, a private wealth manager, is meeting with a client, Garbanzo Patel, in order to create an investment policy statement (IPS) for Patel's upcoming retirement. Patel estimates that he will require €200,000 per year, with annual increases for inflation, during retirement. Patel's primary spending goals during retirement are to provide for his family's needs and maintain his retirement lifestyle. His secondary goals are to fund his philanthropic activities and leave a significant inheritance to his children.

During his retirement, Patel will receive union pension payments of €50,000 per year with annual increases for inflation. In his spare time, Patel runs a small business that provides him with an annual income of €120,000 and is valued at €1 million. He will continue running his business during retirement.

Patel holds a portfolio of securities valued at approximately €4 million. The portfolio primarily contains dividend-paying stocks and interest-bearing bonds. Patel has reinvested all these distributions back into his portfolio but anticipates that after retirement he may need to use some of the distributions to fund his expenses.

Patel plans to buy a vacation home in three years. His budget for the vacation home is approximately €1.4 million. Patel has not decided yet how he will fund this purchase.

4 Prepare the Investment Objectives section of Patel's IPS.

Patel has been working with Zik for 10 years. At the beginning of the 10-year period, Zik forecasted that the equities in Patel's portfolio would outperform their benchmark and that the bonds would match their benchmark. Now, at the end of the 10-year period, equities have outperformed the benchmark, but with higher volatility than the benchmark. In addition, the bonds in the portfolio matched their benchmark performance, but with lower volatility than the benchmark. However, returns and volatility are within IPS specifications for both equities and bonds.

Patel stated his goals to Zik at the beginning of the 10-year period and has not changed them. Patel's plan is to retire this year, and he wants to be able to support a specified annual spending level.

Zik's original capital sufficiency analysis modeled a 6% rate of return, and Patel's portfolio has earned slightly more than that over the 10-year period. Zik's most recent capital sufficiency analysis shows that the portfolio and strategy are very likely to meet Patel's needs as he transitions into retirement.

Zik has followed the guidelines stated in the original IPS in terms of rebalancing the portfolio, maintaining an ongoing dialog with Patel, and coordinating the strategy with Patel's retirement and philanthropic goals. Although fees have remained unchanged at 1%, Zik has been able to reduce expenses for equities by 20 bps and for bonds by 12 bps.

5 Evaluate the success of Zik's investment program for Patel in terms of:

- i. goal achievement.
- ii. process consistency.
- iii. portfolio performance.

After every regular monthly rebalancing, Zik sends an email to Patel with a portfolio report. Zik's portfolio report contains the following:

- An asset allocation report that reflects strategic asset allocation targets
- A detailed performance report that includes individual asset class and security performance
- A year-to-date performance summary report and a historical performance report starting from the inception of Patel's investment strategy

6 Recommend additional information that Zik could provide to enhance his portfolio reports for Patel.

The following information relates to Questions 7 and 8

Val Sili, age 22, has just graduated from college and begins making ambitious future financial plans. The four stages of his plan are summarized below. Sili would like to have outside financial advice at each of these stages.

- Stage 1—Age 22–26:** Sili plans to work as a software developer in a startup company, where he will earn both a salary and stock options. He will save as much as he can to invest, but his portfolio will be relatively small, and he will be willing to pay only low management fees. Sili would like to use a sophisticated mean–variance optimization technique for asset allocation, although he will limit his investments to exchange-traded funds and mutual funds.
- Stage 2—Age 26–30:** Sili will have reached a more senior position in the company. He plans to have accumulated assets of \$350,000, and his investment focus will be on building his portfolio. Sili will want help with his increasing financial planning needs and will be able to afford the fees of a professional wealth manager.
- Stage 3—Age 30–36:** Sili plans to exercise his stock options to buy a large quantity of the company's stock at a price significantly below its market value. The proceeds should increase his portfolio value to \$8 million. Sili will quit his job to start his own software company. Sili will be interested in more sophisticated investments with longer time horizons, greater risk, and less liquidity. He will also want specialized advisers for taxes, legal issues, and investment strategies.
- Stage 4—After Age 36:** Sili will sell his software company for \$200 million and retire. He will spend his retirement traveling on his private jet and collecting artwork for his collection; therefore, he will need advice on acquiring high-end assets. The substantial increase in the value of his investment portfolio will allow him to have a multi-generational time horizon. He will require a wider range of investment advisory services, including complex tax planning, estate planning, and bill payment services.

- 7 Determine** the client segment or adviser type that is *most appropriate* for each stage of Sili's plan. **Justify** each response.

Determine the client segment or adviser type that is *most appropriate* for each stage of Sili's plan. Justify each response.

Stage 1— Age 22–26	Client Segment/Adviser Type: Justification:
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Stage 2— Age 26–30	Client Segment/Adviser Type: Justification:
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Stage 3— Age 30–36	Client Segment/Adviser Type: Justification:
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Stage 4— After Age 36	Client Segment/Adviser Type: Justification:
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Sili next uses three approaches to analyze his retirement goals:

- Approach 1 Sili considers the probability that he will live to a certain age and then predicts his inflation-adjusted retirement spending according to the probability that he will still be living in a given year. This approach allows him to estimate the present value of his retirement spending needs by assigning associated probabilities to annual expected cash outflows.
- Approach 2 Sili determines that he can specify his level of annual spending during retirement and that he can model that spending as a series of fixed payments. He calculates the present value of that series of payments as of the day of his retirement, resulting in the amount of money that he will need to fund his retirement goals.
- Approach 3 Sili models the uncertainty of each key variable individually by assigning each one its own probability distribution and then generates a large number of random outcomes for each variable. He aggregates the outcomes to determine an overall probability of reaching his objectives. Sili sees this as a flexible approach that allows him to explore various scenarios, including unforeseen expenses.

- 8 Identify** each approach that Sili uses to analyze his retirement goals. **Explain** each response.

Identify each approach that Sili uses to analyze his retirement goals. Explain each response.

Approach 1 **Identification:**
 Explanation:

Approach 2 **Identification:**
 Explanation:

Approach 3 **Identification:**
 Explanation:

The following information relates to Questions 9–16

Noémie Açor works for an international bank as a private wealth adviser. Açor speaks several regional languages in addition to her native language. She prepares for two client meetings next week. First, Açor will meet with Winifred Njau, who has recently retired. Njau has made a charitable pledge to a non-profit university endowment, the Udhmini Fund. Açor prepares a draft of the investment objectives section of an investment policy statement (IPS) for Njau using selected client information, which is presented in Exhibit 1.

Exhibit 1 Selected Client Information Items for Njau

Liquidity needs	\$500,000 charitable pledge to Udhhamini payable in 15 years
Risk tolerance	Moderate
Asset allocation	40% equities and 60% fixed income

Açor's notes from her previous meeting with Njau indicate the following behavioral considerations related to Njau's retirement planning:

- Njau would like to increase her level of spending if supported by investment projections.
- Although Njau could pay a lump sum and receive a series of fixed payments, she prefers not to lose control over her assets.
- Njau understands the risk–return relationship and is willing to accept some short-term losses to achieve long-term growth.

Next, Açor reviews a recent risk tolerance questionnaire completed by Njau, which relates to overall portfolio risk. Açor focuses on the type of capital sufficiency analysis to perform for Njau. To determine the optimal allocation, Açor seeks to ensure that Njau's charitable pledge can be met and implements a goal-based investing approach. Açor runs a Monte Carlo simulation to determine the probability of success, which is the likelihood that Njau can meet her charitable pledge objective. The simulation results are presented in Exhibit 2.

Exhibit 2 Monte Carlo Simulation Results for Charitable Pledge (adjusted for inflation)

	Year 10 Portfolio Value (\$)	Year 15 Portfolio Value (\$)	Year 20 Portfolio Value (\$)
25th %	501,288	729,230	1,035,373
50th %	405,927	553,803	767,448
75th %	331,056	422,746	563,039

One week after this meeting, the bank sends a client satisfaction survey to Njau. In response to questions about Açor's soft skills and technical skills, Njau responds with the following comments:

- Comment 1 Açor constructed a portfolio that is appropriate for my unique situation.
- Comment 2 Açor spoke to me in my own regional language throughout the meeting.
- Comment 3 Açor educated me about how my investments perform and affect my portfolio.

Açor's second meeting will be with Thanh Bañuq. Bañuq is Njau's nephew and serves on the board of directors of Udhhamini. Açor obtained the essential facts about Bañuq when she opened his account, including his risk and return objectives and the origin of his wealth. In preparation for the meeting, Açor considers the high level of taxes that Bañuq pays. Açor will recommend changing the asset location of high-dividend-paying equities that Bañuq owns from a taxable account to a retirement account with tax-free earnings and withdrawals.

During their meeting, Açor and Bañuq discuss charitable pledges that Udhamini has recently received and the likelihood that Njau will meet her charitable pledge. Bañuq then asks Açor the following question:

“How might my investment objectives and constraints differ from those of a typical university endowment, such as Udhamini?”

The day after Açor’s meeting with Bañuq, Açor realizes that her actions in the meeting may have raised an ethical concern.

- 9 Based on Exhibit 1, which of the following items is Açor *most likely* to include in the section of the IPS she is drafting for Njau?
- A Moderate risk tolerance
 - B 40% allocation to equities
 - C \$500,000 charitable pledge in 15 years
- 10 Based on Açor’s notes from her previous meeting with Njau, the behavioral consideration exhibited by Njau is *most likely*:
- A a consumption gap.
 - B the “annuity puzzle.”
 - C heightened loss aversion.
- 11 Açor’s portfolio allocation for Njau is *most likely* optimized on the basis of:
- A a stated maximum level of volatility.
 - B total portfolio mean–variance efficiency.
 - C the results of the risk tolerance questionnaire.
- 12 Based on Exhibits 1 and 2, the probability that Njau will be able to meet her charitable goal is *closest* to:
- A 25%.
 - B 50%.
 - C 75%.
- 13 Which comment in Njau’s response to the client satisfaction survey *best* describes a soft skill exhibited by Açor?
- A Comment 1
 - B Comment 2
 - C Comment 3
- 14 Açor’s recommendation regarding asset location in Bañuq’s portfolio is *most likely* an example of tax:
- A deferral.
 - B reduction.
 - C avoidance.
- 15 The *most appropriate* response to Bañuq’s question is that he has:
- A a shorter time horizon.
 - B less significant tax considerations.
 - C less diverse investment objectives.
- 16 The ethical concern that Açor *most likely* raised is:
- A KYC.

- B** suitability.
 - C** confidentiality.
-

SOLUTIONS

- 1 McZhao should obtain the following additional personal information from Cree:

- Family situation: Marital status, children and grandchildren, ages of family members
- Identification: Copy of driver's license or passport
- Additional career information: Future aspirations for career, business, and retirement
- Investment background
- More details on financial goals and risk tolerance

McZhao has already learned about Cree's current employment, experience with market volatility, interest in meeting specific goals rather than a particular return objective, low current liquidity needs, and investment preferences based on his environmental and social concerns.

Now that Cree has become a private client, a starting point of the relationship is for McZhao to learn about his client's family situation, such as marital status, children and grandchildren, and ages of family members. McZhao should also obtain proof of client identification (copy of driver's license or passport). Cree's employment and career information is important, as is discussion about his future career, business, and retirement aspirations.

In addition, wealth managers should assess the client's investment background. As part of the investment background conversation, the wealth manager should determine whether the client has an explicit return objective or specific investment preferences. Finally, a detailed conversation about the client's financial objectives/goals and risk tolerance is part of the personal-information-gathering process.

- 2 With respect to goal quantification, Cree has quantified his retirement spending needs, the cost to maintain his antique purchases, and his wife's philanthropic support. McZhao should work with Cree to help estimate the costs for his children's university expenses and what he expects to pay for the investment property.

With respect to goal prioritization, even though Cree believes that his highest priority is his next big expense (\$15,000 for this year's additions to his antique collection), the timing of that expense should not be the sole determinant of its priority. McZhao needs to discuss with Cree which of his goals are most important. The purchases of expensive antiques and the large philanthropic contributions may adversely affect Cree's ability to fund his retirement lifestyle. Therefore, McZhao should help Cree consider reevaluating his priorities.

3

Determine Cree's degree of risk tolerance associated with each of the following individual goals. Justify each response.

Goal	Degree of Risk Tolerance	Justification
Retirement	Lower	Retirement is a long-term goal. Cree is willing to incur a moderate drop in his planned expenses, so he likely has a higher risk tolerance for that goal. Cree is concerned about paying future medical expenses in retirement, and since his retirement is still 17 years in the future, he likely has a higher risk tolerance with the medical expenses goal.
	Higher	
Investment Property	Lower	Because the investment property is an important near-term goal, Cree likely has a lower risk tolerance with this goal. Similarly, he likely has a lower risk tolerance with the goal of funding maintenance and repairs for the property.
	Higher	
Philanthropy	Lower	Cree's wife's influence regarding their philanthropic giving makes Cree unwilling to stop his contributions completely, but he believes she will accept maintaining their contributions rather than increasing them substantially. As a result, Cree likely has a higher risk tolerance with this goal.
	Higher	
Antique Furniture	Lower	Cree is likely highly risk tolerant with his goal of purchasing antique furniture, because he is willing to cut that expense altogether.
	Higher	

4 Investment Objectives:

- Purpose: Support Patel's lifestyle in retirement (higher priority), provide for family's needs (higher priority), fund philanthropic activities (lower priority), provide inheritance for children (lower priority)
- Anticipated annual need: €200,000, with annual increases for inflation
- Annual need met with: Income from small business (approx. €120,000), pension (€50,000 with annual inflation increases), portfolio distributions
- Intent to purchase of €1.4 million vacation home in three years
- Zik should assist in quantifying philanthropic and bequest goals and determining how to fund the vacation home purchase.

The purpose of this portfolio is to support Garbanzo Patel's lifestyle in retirement, to provide for his family's needs, to fund his philanthropic activities, and to provide an inheritance for his children. Patel's primary objective is to provide for his family's needs and support his lifestyle during his retirement. The philanthropic and bequest objectives are lower priorities.

To meet all his objectives, Patel anticipates needing €200,000 per year, with annual increases for inflation. His cash needs will be primarily satisfied through income from his small business of approximately €120,000 per year and his union pension payments of €50,000 per year. The pension payments will increase annually for inflation. Any remaining cash needs will be satisfied by taking distributions from his portfolio.

Patel also intends to purchase a vacation home in three years and plans to pay approximately €1.4 million.

Patel has not articulated specific amounts for his philanthropic activities or his children's inheritances. Zik should work with Patel to quantify his philanthropic and bequest goals and to decide on the best way to fund the purchase of his vacation home.

- 5 By all three criteria, Zik has been successful.

Goal achievement:

- Patel's portfolio has achieved its goals with an acceptable amount of risk; its return and volatility have remained within the original IPS specifications.
- The portfolio remains likely to succeed as an ongoing strategy, without meaningful adjustments to the plan; the most recent capital sufficiency analysis shows that the strategy is very likely to meet Patel's retirement needs.

Process consistency:

- Zik has followed the guidelines stated in the original IPS, has maintained an ongoing dialogue with Patel, has coordinated the strategy with Patel's retirement and philanthropic goals, and has even managed to reduce expenses.

Portfolio performance (over the 10-year time horizon):

- The equity portion of Patel's portfolio outperformed its benchmark but had higher volatility than the benchmark.
- The bond portion of the portfolio matched its benchmark but had lower volatility than the benchmark.
- The performance of both equities and bonds remained within the original IPS specifications.
- For the overall portfolio, Zik targeted a 6% rate of return, and the portfolio has slightly exceeded that level over the period.

- 6 Zik's portfolio reporting can be made more effective by including the following items:

- A transaction details report showing contributions, withdrawals, interest and dividends, and capital appreciation for the current period
- A purchase and sale report for the current period
- Currency exposure report detailing the effects of exchange rate fluctuations
- A benchmark report that shows the performance of Patel's equity and bond portfolios relative to their respective benchmarks and the overall portfolio performance relative to a blended benchmark (based on weights that are appropriate for Patel's holdings)
- An accompanying letter that provides market commentary, investment context, education, and other advice

7

Determine the client segment or adviser type that is *most appropriate* for each stage of Sili's plan. Justify each response.

Stage 1— Age 22–26	Client Segment/Adviser Type:	Robo-Adviser (part of the mass affluent client segment)
	Justification:	<p>Robo-advisers support advanced asset allocation techniques, implement typically with exchange-traded funds or mutual funds, and are lower-cost alternatives for relatively small portfolios.</p> <p>During this stage, Sili's portfolio will be relatively small and he will not be able to afford to pay the fees of a traditional wealth management firm. Yet he still wants to use sophisticated analysis for his investment planning. Robo-advisers are his most appropriate option. With their primarily digital client interface and experience, robo-advisers are designed to serve investors with relatively small portfolios at a lower cost than the fees charged by traditional wealth management firms. Robo-advisers enable their clients to use advanced techniques, such as mean–variance optimization, for determining asset allocations, and they implement their strategies typically with exchange-traded funds or mutual funds.</p>
Stage 2— Age 26–30	Client Segment/Adviser Type:	Mass Affluent Segment
	Justification:	<p>The mass affluent segment covers asset levels between \$250,000 and \$1 million and serves clients who are focused on building their portfolios and want help with financial planning needs.</p> <p>Now that Sili has a larger portfolio and is able to afford paying fees to a professional wealth manager, he belongs in the mass affluent client segment. With investment assets of \$350,000, Sili's portfolio fits within the asset level range of this segment, typically \$250,000–\$1,000,000. Sili's characteristics during Stage 2 of being focused on building his portfolio and wanting help with his financial planning needs are typical of younger clients in the mass affluent segment.</p>
Stage 3— Age 30–36	Client Segment/Adviser Type:	“Private Client” Range of High-Net-Worth Segment
	Justification:	<p>The private client range in the high-net-worth segment covers asset levels between \$1 million and \$10 million and can provide a team of specialized advisers that supports more customized strategies for more sophisticated investments with longer time horizons, greater risk, and less liquidity. Sili's higher asset level of \$8 million puts him in the range of the high-net-worth segment. This segment generally consists of clients with liquid investment assets ranging from \$1 million to \$50 million. Since this range is so wide, firms often focus on only a portion of the segment. A client such as Sili with assets between \$1 million and \$10 million falls within a range that is known in some geographic markets as the “private client” segment.</p> <p>Sili's interest in more sophisticated investments with longer time horizons, greater risk, and less liquidity requires a more customized strategy and stronger product knowledge from the wealth manager, and he is better served by a manager that specializes in high-net-worth clients than by a manager for the mass affluent segment. Also, with a wealth manager that specializes in high-net-worth clients, Sili will likely be served by a team of people with specialized and complementary skills, including tax advisers, legal advisers, investment specialists, and a relationship manager.</p>

(continued)

Determine the client segment or adviser type that is *most appropriate* for each stage of Sili's plan. Justify each response.

Stage 4— After Age 36	Client Segment/Adviser Type: Justification:	Ultra-High-Net-Worth Segment The ultra-high-net-worth segment covers asset levels over \$50 million for clients with multi-generational time horizons and provides a wider range of services for complex tax situations, estate planning, bill payment, concierge services, travel planning, and advice on acquiring high-end assets. At this stage, Sili's portfolio value of \$200 million puts him in the ultra-high-net-worth client segment, which handles clients with liquid investment assets exceeding approximately \$50 million. As is characteristic of clients in this segment, Sili now has a multi-generational time horizon, highly complex tax and estate planning considerations, and a wider range of service needs. An ultra-high-net-worth adviser can assist Sili with bill payment services, concierge services, travel planning, and advice on acquiring such assets as artwork and aircraft.
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8

Identify each approach that Sili uses to analyze his retirement goals. Explain each response.

Approach 1	Identification: Explanation:	Mortality Tables A mortality table allows for estimating the present value of retirement spending needs by associating each outflow with a probability based on life expectancy. Sili uses a mortality table to determine the probability that he will live to a certain age. This information allows him to predict his anticipated inflation-adjusted retirement spending according to the probability that he will be living in a given year. A mortality table illustrates an individual's life expectancy at any given age. A wealth manager can use a mortality table to estimate the present value of a client's retirement spending needs by assigning associated probabilities to annual expected cash outflows.
Approach 2	Identification: Explanation:	Annuity Method The calculated price of an annuity equals the present value of a series of future fixed outflows during retirement. A relatively simple way for Sili to calculate the present value of his desired retirement spending is by pricing an annuity. Annuities provide a series of fixed payments, either for life or for a specified period, in exchange for a lump sum payment.

Identify each approach that Sili uses to analyze his retirement goals. Explain each response.

Approach 3	Identification:	Monte Carlo Simulation
	Explanation:	<p>Monte Carlo simulation yields an overall probability of meeting retirement needs by aggregating the results of many trials of probability-based estimates of key variables, and it is a flexible approach for exploring different retirement scenarios.</p> <p>Monte Carlo simulation can analyze the likelihood of Sili's portfolio meeting his anticipated retirement needs. This simulation models the uncertainty of the key variables and the uncertainty or variability in the future outcome. A Monte Carlo simulation uses assumptions of probability distributions for the key variables and then runs a large number of independent trials that generate many random outcomes. These outcomes are then aggregated to determine the probability of Sili reaching his investment objectives.</p> <p>An advantage of Monte Carlo simulation for retirement planning is its flexibility in modeling and exploring different scenarios. Typically, retirement goals are more complex than a fixed, annual cash flow need. For instance, if Sili wishes to determine the effect of a significant purchase/gift or large unforeseen expenses, he can model these scenarios with a Monte Carlo simulation.</p>

- 9 C is correct. AÇor is preparing a draft of the investment objectives section of an IPS for Njau. Investment objectives include identifying funding needs and goals for the portfolio. So, AÇor should include the \$500,000 charitable pledge to Udhamini in 15 years in the investment objectives section of the IPS. Njau's goal is specific and is an important part of the investment objectives that will drive the preparation of the remainder of the IPS and the execution of the investment strategy.
- 10 B is correct. The "annuity puzzle" describes the phenomenon that retirees tend to avoid annuity investments, which may be appropriate to best help them reach their financial goals. An annuity provides a series of fixed payments, either for life or for a specified period, in exchange for a lump sum payment. Njau's reluctance to lose control over her assets by paying the lump sum in exchange for the fixed payments is one explanation for her reluctance, and she may also believe that an annuity would minimize the chance of a substantial improvement in her lifestyle.
- 11 A is correct. AÇor uses the goal-based investing approach by allocating with a focus on Njau's charitable pledge to Udhamini. With this method, she seeks to optimize Njau's portfolio so that the pledge goal has a high probability of being met. AÇor will set aside a required amount of funds to invest, and a mean–variance optimization will be run specifically for that portion of Njau's portfolio. The funds will be invested to a stated maximum level of volatility to meet the charitable need.
- 12 B is correct. The Monte Carlo simulation shows that Njau has a 50% probability of having an amount exceeding \$553,803 in Year 15. Since Njau's charitable pledge goal to Udhamini is \$500,000, she has a slightly greater than 50% probability of meeting or exceeding her charitable pledge goal in Year 15.
- 13 C is correct. AÇor's ability to effectively educate Njau by showing Njau how her investments perform and affect her portfolio is a soft skill. Soft skills involve interpersonal relationships and include communication skills, social skills, education and coaching skills, and business development and sales skills.

- 14 C is correct. Changing the location of high-dividend-paying equities away from Bañuq's taxable account to a retirement account with tax-free earnings and future liquidity events is an example of a tax avoidance strategy. Implementing this asset location change will eliminate the taxes that Bañuq would have been required to pay on investment income and gains in this account.
- 15 A is correct. As a private client, Bañuq is more likely to have a shorter time horizon than that of Udhamini. Thus, Bañuq is likely to be more constrained with respect to risk taking and liquidity. A typical university endowment has a long time horizon, which can theoretically be infinite.
- 16 C is correct. The confidentiality standard is likely a concern because Açor may have shared confidential private information about Njau and her finances when she discussed Njau's charitable pledge with her nephew, Bañuq. Standard III(E): Preservation of Confidentiality obliges wealth managers who possess highly personal and sensitive client information to maintain confidentiality. Keeping confidential information private may be challenging for Açor since she manages the portfolios of both family members.

READING

29

Taxes and Private Wealth Management in a Global Context

by Stephen M. Horan, PhD, CFA, CIPM, and
Thomas R. Robinson, PhD, CFA

Stephen M. Horan, PhD, CFA, CIPM, is at CFA Institute (USA). Thomas R. Robinson, PhD, CFA, is at AACSB International (USA).

LEARNING OUTCOMES

Mastery	The candidate should be able to:
<input type="checkbox"/>	a. compare basic global taxation regimes as they relate to the taxation of dividend income, interest income, realized capital gains, and unrealized capital gains;
<input type="checkbox"/>	b. determine the effects of different types of taxes and tax regimes on future wealth accumulation;
<input type="checkbox"/>	c. explain how investment return and investment horizon affect the tax impact associated with an investment;
<input type="checkbox"/>	d. discuss the tax profiles of different types of investment accounts and explain their effects on after-tax returns and future accumulations;
<input type="checkbox"/>	e. explain how taxes affect investment risk;
<input type="checkbox"/>	f. discuss the relation between after-tax returns and different types of investor trading behavior;
<input type="checkbox"/>	g. explain tax loss harvesting and highest-in/first-out (HIFO) tax lot accounting;
<input type="checkbox"/>	h. demonstrate how taxes and asset location relate to mean–variance optimization.

INTRODUCTION

1

Private wealth managers have the basic goal of maximizing after-tax wealth subject to a client's risk tolerance and portfolio constraints. Portfolio managers can add value in a number of ways, such as buying undervalued securities, selling overpriced securities, and improving asset allocations. This is challenging in highly efficient markets where

informational advantages are difficult to exploit as market participants compete with each other in search of abnormal returns. Managing a portfolio efficiently from a tax perspective, however, is a reasonable goal in almost all markets. In most economies around the world, taxes have a significant impact on net performance and affect an adviser's understanding of risk for the taxable investor. Tax rates, particularly those for high-net-worth (HNW) individuals, are non-trivial and typically affect returns more than portfolio management costs.

Despite a long history of high tax rates on investment returns, most modern portfolio theory is grounded in a pretax framework. This phenomenon is understandable because most institutional and pension portfolios are tax-exempt. As more wealth becomes concentrated with individuals, it is important to examine the impact of taxes on risk and return characteristics of a portfolio and wealth accumulation. The purpose of this reading is to outline basic concepts that serve as the foundation for building tax-aware investment models that can be applied in a global environment.

The approach developed here is valuable for several reasons. First, it can be applied in a broad range of circumstances representing different taxing jurisdictions, asset classes, and account types. Second, it can provide a framework with which advisers can better communicate the impact of taxes of portfolio returns to private clients and develop techniques to improve their after-tax performance. Third, tax codes change over time. The models developed here provide the adviser a framework to manage changes should they occur.

2

OVERVIEW OF GLOBAL INCOME TAX STRUCTURES

Tax structures (the specifics of how governments collect taxes) are determined by national, regional, and local jurisdictions in order to meet governmental funding needs. Major sources of government tax revenue include:

- *Taxes on income.* These taxes apply to individuals, corporations, and often other types of legal entities. For individuals, income types can include salaries, interest, dividends, realized capital gains, and unrealized capital gains, among others. Income tax structure refers to how and when different types of income are taxed.
- *Wealth-based taxes.* These include taxes on the holding of certain types of property (e.g., real estate) and taxes on the transfer of wealth (e.g., taxes on inheritance).
- *Taxes on consumption.* These include sales taxes (which are taxes collected in one step from the final consumer on the price of a good or service) and value-added taxes (which are collected in intermediate steps in the course of producing a good or service but borne ultimately by the final consumer).

This reading's focus will be on the taxes that most directly affect tax planning for investments, specifically taxes on investment income to individuals and, secondarily, wealth-based taxes.

In many cases, the tax system is used to encourage or discourage certain activities (for example, investing in domestic companies or encouraging retirement savings). Tax structures vary globally and can change as the needs and objectives of the governmental jurisdiction change. In such a dynamic environment, the investment manager needs to understand the impact of different tax structures on investment returns and wealth. Rather than delineate specific country tax rules, this reading provides

a framework for managers to understand and implement investment strategies in a dynamic environment where different tax environments may apply to different clients and tax environments can change over time.

2.1 International Comparisons of Income Taxation

We reviewed the taxation of different types of income, particularly investment income, around the world in order to summarize the major tax regimes.¹ The review was based on data from over 50 countries as reported in the Deloitte Touche Tohmatsu International Business Guides, which were available during the summer of 2007. This summary provided the basis for our discussion of the common elements of individual income taxation around the world and our classification of different countries into general income tax regimes.

2.2 Common Elements

In most tax jurisdictions, a tax rate structure applies to ordinary income (such as earnings from employment). Other tax rates may apply to special categories of income such as investment income (sometimes referred to as capital income for tax purposes). Investment income is often taxed differently based on the nature of the income: interest, dividends, or capital gains and losses. Most of the countries examined in our review have a progressive ordinary tax rate structure. In a progressive rate structure, the tax rate increases as income increases. For example:

Taxable Income (€)		Tax on Column 1	Percentage on Excess Over Column 1
Over	Up to		
0	15,000	—	23
15,000	28,000	3,450	27
28,000	55,000	6,960	38
55,000	75,000	17,220	41
75,000		25,420	43

In such an environment, if an individual has taxable income of €60,000, the first €15,000 is taxed at 23 percent; the next €13,000 (i.e., from €15,000 to €28,000) is taxed at 27 percent; and so on. The amount of tax due on taxable income of €60,000 would be €17,220 + 0.41(€60,000 – €55,000) or €19,270. This would represent an average tax rate of €19,270/€60,000 or 32.12 percent. In tax planning for investments, it is useful to think about how much tax would be paid on additional income, known as the marginal tax rate. The marginal rate, or rate on the next €1 of income, would be 41 percent in this example. This taxpayer could have €15,000 more in income before moving into the next tax bracket (a new marginal rate of 43 percent). Some countries do not have a progressive tax system and instead impose a flat tax. In a flat tax structure, all taxable income is taxed at the same rate. For example, at the time of this writing, Russia had a flat tax rate of 13 percent.

Many countries provide special tax provisions for interest income. These special provisions included an exemption for certain types of interest income (for example, Argentina exempted interest income from Argentine banks for residents), a favorable tax rate on interest income (for example, Italy taxed some interest income at 12.5 percent even though the minimum marginal rate is 23 percent), or an exclusion

¹ The guides are available at www.deloitte.com and are updated on a rotational basis. As a result, some data may not be current as of the summer of 2007.

amount where some limited amount of interest income is exempt from tax (for example, Germany provided such an exclusion). Some fixed income instruments are indexed for inflation and this inflation adjustment may not be subject to taxation in some jurisdictions. Unless special provisions exist, interest income, including inflation adjustments, is taxed at the tax rates applicable to ordinary income (ordinary rates).

Similarly, dividend income may have special provisions. In some cases there are exemptions, special tax rates, or exclusions as described above for interest income. In other cases, there may be provisions for mitigating double taxation because dividends are a distribution of company earnings and the company may have already paid tax on the earnings. Tax credits can be used to mitigate the effects of double taxation. For example, the dividend can be taxed at ordinary rates but the individual is entitled to a credit for a portion of the taxes paid by the company (referred to as “franking” in some jurisdictions such as Australia). As with interest income, absent special rules dividend income is taxed at ordinary rates.

Finally, capital gains (losses) may have special provisions or rates. These often vary depending upon how long the underlying investment has been held. Generally, long term gains are treated more favorably than short term gains. Long term is defined differently in different jurisdictions; for example, in the data examined, we observed required holding periods of six months, one year, two years, and five years. Special provisions observed included total exemption of capital gains or long-term capital gains from taxation (for example, Austria exempted long-term gains), exemption of a certain percentage of gains from taxation (for example, Canada exempted 50 percent of gains), a favorable tax rate on capital gains (for example, Brazil provided a flat 15 percent rate for capital gains), or indexing the cost of the investment for inflation (for example, India permitted inflation indexing for some investments). In some cases, countries provided more favorable provisions for domestic companies or companies traded on a local exchange (sometimes applied to both dividend income and capital gains). In most cases, only realized gains were taxed (when the investment was sold). In rare cases, countries impose a tax on unrealized gains (appreciation of the investment prior to sale) either annually, upon exiting the country to relocate domicile, or upon inheritance.²

EXAMPLE 1

Tax Rates

Vanessa Wong is a new client living in a jurisdiction with a progressive tax rate structure. She expects to have taxable ordinary income of €70,000 this year. The tax rate structure in her jurisdiction is as follows:

Taxable Income (€)		Tax on Column 1	Percentage on Excess Over Column 1
Over	Up to		
0	30,000	—	20
30,000	60,000	6,000	30
60,000	90,000	15,000	40
90,000		27,000	50

- 1 Wong’s marginal tax rate is *closest* to:
A 35%.

² In other cases upon inheritance the recipient receives a “step-up in basis” such that for tax purposes the value on the date of death is used to compute any future gain or loss.

- B 40%.
C 50%.
- 2 Wong's average tax rate is *closest* to:
- A 27%.
B 35%.
C 40%.

Solution to 1:

B is correct. Wong's marginal tax rate is 40 percent. Because Wong's income is over €60,000 but below €90,000, her next €1 of income would be taxed at 40 percent.

Solution to 2:

A is correct. Wong's tax liability would be $€15,000 + 0.40 (€70,000 - €60,000) = €19,000$. With a tax liability of €19,000 and taxable income of €70,000, her average tax rate would be about 27 percent ($€19,000/€70,000$).

2.3 General Income Tax Regimes

Each country's income tax structure can be classified as either progressive or flat. Income tax regimes can be further distinguished based on the taxation of investment returns in taxable accounts. Interest income is either taxed at ordinary rates or at favorable rates under special provisions. In this review, interest income is considered to be taxable at ordinary rates unless significant exceptions apply. Similar classifications were used for dividends and capital gains. Seven different tax regimes were observed in the sample of countries examined. Exhibit 1 classifies common elements of tax regimes and is further explained below.

- **Common Progressive Regime:** This regime has progressive tax rates for ordinary income, but favorable treatment in all three investment income categories: interest, dividends, and capital gains. This was the most common regime observed. Even though categorized as "common," there is variation within this regime with some countries treating some interest income as ordinary and other interest income as tax exempt, while other countries provide for exemption or special treatment for all interest.
- **Heavy Dividend Tax Regime:** This regime has a progressive tax system for ordinary income and favorable treatment for some interest and capital gains but taxes dividends at ordinary rates.
- **Heavy Capital Gain Tax Regime:** This regime has a progressive tax system for ordinary income and favorable treatment for interest and dividends, but taxes capital gains at ordinary rates. Only one such country was observed.
- **Heavy Interest Tax Regime:** This regime has a progressive tax system for ordinary income and favorable treatment for dividends and capital gains, but taxes interest income at ordinary rates.
- **Light Capital Gain Tax Regime:** This regime has a progressive tax system for ordinary income, interest, and dividends, but favorable treatment of capital gains. This was the second most commonly observed regime.

Exhibit 1 Classification of Income Tax Regimes

Income Tax Regime	1 – Common Progressive	2 – Heavy Dividend Tax	3 – Heavy Capital Gain Tax	4 – Heavy Interest Tax	5 – Light Capital Gain Tax	6 – Flat and Light	7 – Flat and Heavy
Ordinary Tax Rate Structure	Progressive	Progressive	Progressive	Progressive	Progressive	Flat	Flat
Interest Income	Some interest taxed at favorable rates or exempt	Some interest taxed at favorable rates or exempt	Some interest taxed at favorable rates or exempt	Taxed at ordinary rates	Taxed at ordinary rates	Some interest taxed at favorable rates or exempt	Some interest taxed at favorable rates or exempt
Dividends	Some dividends taxed at favorable rates or exempt	Taxed at ordinary rates	Some dividends taxed at favorable rates or exempt	Some dividends taxed at favorable rates or exempt	Taxed at ordinary rates	Some dividends taxed at favorable rates or exempt	Taxed at ordinary rates

Exhibit 1 (Continued)

Income Tax Regime	1 – Common Progressive	2 – Heavy Dividend Tax	3 – Heavy Capital Gain Tax	4 – Heavy Interest Tax	5 – Light Capital Gain Tax	6 – Flat and Light	7 – Flat and Heavy
Capital Gains	Some capital gains taxed favorably or exempt	Some capital gains taxed favorably or exempt	Taxed at ordinary rates	Some capital gains taxed favorably or exempt	Some capital gains taxed favorably or exempt	Some capital gains taxed favorably or exempt	Taxed at ordinary rates
Examples	Austria Brazil China Czech Republic Finland France Greece Hungary Ireland Italy Japan Latvia Malaysia Netherlands Nigeria Philippines Poland Portugal Singapore South Africa Sweden Thailand United Kingdom United States Vietnam	Argentina Indonesia Israel Venezuela	Colombia	Canada Denmark Germany Luxembourg Pakistan	Australia Belgium India Kenya Mexico New Zealand Norway Spain Switzerland Turkey	Kazakhstan Russia Saudi Arabia (Zakat)	Ukraine

Sources: Classified based on information provided in International Business Guides from Deloitte Touche Tohmatsu (available at www.deloitte.com) and online database of worldwide taxation provided by PricewaterhouseCoopers (www.taxsummaries.pwc.com).

- *Flat and Light Regime:* This regime has a flat tax system and treats interest, dividends, and capital gains favorably.
- *Flat and Heavy Regime:* This regime has a flat tax system for ordinary income, dividends, and capital gains. It does not have favorable treatment for dividends and capital gains, but has favorable treatment for interest income.

2.4 Other Considerations

In addition to the different tax regimes in which different types of income are taxed at possibly different rates, there are other important dimensions in tax planning for investments. Some countries permit the use of tax deferred retirement accounts. A tax deferred account

- defers taxation on investment returns within the account;
- may permit a deduction for contributions;
- may occasionally permit tax free distributions.

On the other hand, a few countries impose a wealth tax on accumulations on a periodic basis which reduces after-tax returns and accumulations similar to income taxes.

In the next section we will examine how taxes affect after-tax returns and accumulations. We also examine the impact of tax deferred accounts and wealth taxes. In a later section we will discuss planning opportunities suitable for the various tax regimes.³

3

AFTER-TAX ACCUMULATIONS AND RETURNS FOR TAXABLE ACCOUNTS

Taxes on investment returns have a substantial impact on performance and future accumulations. This section develops models to estimate the tax impact on future accumulations in various tax environments. These models enable the investment adviser to evaluate potential investments for taxable investors by comparing returns and wealth accumulations for different types of investments subject to different tax rates and methods of taxation (accrued annually or deferred).

3.1 Simple Tax Environments

As the preceding analysis of global tax regimes suggests, investment returns can be taxed in a number of different ways. This section begins with some straightforward methods that illustrate basic concepts and serve as building blocks for more complex environments.

All but four of the countries studied in the tax regime analysis have a progressive income tax system.⁴ The discussion in this section assumes uniform marginal tax rates based on the investor's current tax bracket which is effectively flat for some range of income. Models that accommodate multiple tax brackets grow in complexity very quickly. Also, investors are often subject to a single rate on the margin, limiting the usefulness of an analysis based on multiple tax brackets. Finally, much of the intuition and analysis that is derived in a flat tax framework applies in a setting with multiple tax brackets.

³ Gift, death, or estate taxes are also imposed in some jurisdictions. These are not addressed in this reading.

⁴ Countries with a flat tax include the Ukraine, Russia, Kazakhstan, and Saudi Arabia.

3.1.1 Returns-Based Taxes: Accrual Taxes on Interest and Dividends

One of the most straightforward methods to tax investment returns is to tax an investment's annual return at a single tax rate, regardless of its form. Accrual taxes are levied and paid on a periodic basis, usually annually, as opposed to deferred taxes that are postponed until some future date. Most of the countries examined above tax interest income on an accrual basis annually, either at ordinary rates or at favorable rates as the result of special provisions. Germany, Greece, Canada, Colombia, and the United States, for example, tax most interest income at ordinary rates, although some interest income may receive favorable tax treatment. Japan, Finland, the Czech Republic, and the United Kingdom, among other jurisdictions, tax interest income at a special fixed rate. Dividends, like interest income, are typically taxed in the year they are received, albeit often at different rates.

When returns are subject to accrual taxes, the after-tax return is equal to the pretax return, r , multiplied by $(1 - t_i)$ where t_i represents the tax rate applicable to investment income. For the purposes of this section, we consider an investment with a return that is entirely taxed at a single uniform rate.

The amount of money accumulated for each unit of currency invested after n years, assuming that returns (after taxes at rate t_i are paid) are reinvested at the same rate of return, r , is simply

$$FVIF_i = [1 + r(1 - t_i)]^n \quad (1)$$

Equation 1 is simply a future value interest factor (FVIF) based on an after-tax return. For example, €100 invested at 6 percent per annum for ten years in an environment in which returns are taxed each year at a rate of 30 percent will accumulate to be $€100[1 + 0.06(1 - 0.30)]^{10} = €150.90$. Had returns not been taxed, this investment would have grown to $€100[1 + 0.06(1 - 0.00)]^{10} = €179.08$, a difference of €28.18. Notice that taxes reduce the potential gain on investment by $(€179.08 - €150.90) / (€179.08 - €100.00) = €28.18 / €79.08 = 35.6$ percent, which is more than the ordinary income tax rate. This suggests that the tax drag on capital accumulation compounds over time when taxes are paid each year. (Tax drag refers to the negative effect of taxes on after-tax returns.) By contrast, when taxes on gains are deferred until the end of the investment horizon, the tax rate equals the tax drag on capital accumulation as we shall see in the next section.

Exhibit 2 illustrates the impact of taxes on capital growth for various investment horizons and rates of return and demonstrates several conclusions. First, when investment returns are taxed annually, the effect of taxes on capital growth is greater than the nominal tax rate as noted above. Second, the adverse effects of taxes on capital growth increase over time. That is, the proportional difference between pretax and after-tax gains grows as the investment horizon increases. Third, the tax drag increases as the investment return increases, all else equal. Fourth, return and investment horizon have a multiplicative effect on the tax drag associated with future accumulations. Specifically, the impact of returns on the tax effect is greater for long investment horizons, and the impact of investment horizon is greater for higher returns because figures in the bottom right corner change more rapidly than figures in the upper left corner.

Exhibit 2 Proportion of Potential Investment Growth Consumed by Annual Taxes on Return

Investment Horizon in Years (n)								
r (%)	5	10	15	20	25	30	35	40
2	0.308	0.319	0.330	0.340	0.351	0.362	0.373	0.384
4	0.317	0.338	0.359	0.381	0.403	0.425	0.447	0.469

(continued)

Exhibit 2 (Continued)

<i>r</i> (%)	Investment Horizon in Years (<i>n</i>)							
	5	10	15	20	25	30	35	40
6	0.325	0.356	0.389	0.421	0.454	0.486	0.518	0.549
8	0.333	0.375	0.418	0.461	0.503	0.545	0.584	0.622
10	0.341	0.393	0.446	0.499	0.550	0.598	0.643	0.684
12	0.348	0.411	0.474	0.535	0.593	0.646	0.694	0.737
14	0.356	0.429	0.501	0.569	0.633	0.689	0.739	0.781
16	0.364	0.446	0.526	0.601	0.669	0.727	0.776	0.818
18	0.371	0.462	0.551	0.631	0.701	0.760	0.808	0.848

Note: The calculations assume a 30 percent annual tax rate on investment returns.

Conceptually, this framework could apply to securities, such as fixed-income instruments or preferred stock, in which most or possibly all of the return is subject to annual taxes. This is an oversimplification, of course, but we will address that concern below.

EXAMPLE 2**Accrual Taxes**

Vladimir Kozloski is determining the impact of taxes on his expected investment returns and wealth accumulations. Kozloski lives in a tax jurisdiction with a flat tax rate of 20 percent which applies to all types of income and is taxed annually. Kozloski expects to earn 7 percent per year on his investment over a 20 year time horizon and has an initial portfolio of €100,000.

- 1 What is Kozloski's expected wealth at the end of 20 years?
- 2 What proportion of potential investment gains were consumed by taxes?

Solution to 1:

$$\begin{aligned}
 FV &= €100,000 \times FVIF_i \\
 &= €100,000 \times [1 + 0.07(1 - 0.20)]^{20} \\
 &= €297,357.
 \end{aligned}$$

Solution to 2:

Ignoring taxes, $FV = €100,000 [1 + 0.07]^{20} = €386,968$. The difference between this and the after tax amount accumulated from above is €89,611. The proportion of potential investment gains consumed by taxes was $€89,611/€286,968 = 31.23$ percent.

3.1.2 Returns-Based Taxes: Deferred Capital Gains

Another straightforward method of taxing returns is to focus on capital gains, the recognition of which can usually be deferred until realized, instead of interest income and dividends, which are generally taxable each year. A portfolio of non-dividend-paying

stocks could fall under this type of framework. The analysis of global tax systems in the previous section indicates that it is very rare for unrealized investment gains to be taxed, so this implicit deferral mechanism has nearly universal application.

If the tax on an investment's return is deferred until the end of its investment horizon, n , and taxed as a capital gain at the rate t_{cg} , then the after-tax future accumulation for each unit of currency can be represented in several ways, including the following:

$$FVIF_{cg} = (1 + r)^n - [(1 + r)^n - 1]t_{cg} \quad (2a)$$

$$FVIF_{cg} = (1 + r)^n(1 - t_{cg}) + t_{cg} \quad (2b)$$

The first term of Equation 2a represents the pretax accumulation. The bracketed term is the capital gain (i.e., future accumulation less the original basis), while the entire second term represents the tax obligation on that gain. Viewed differently, the first term of Equation 2b represents the future accumulation if the entire sum (including the original basis) were subject to tax. The second term returns the tax of the untaxed cost (also known as cost basis or basis) associated with the initial investment.

For example, €100 invested at 6 percent for ten years in an environment in which capital gains are taxed at the end of that time at a rate of 30 percent will accumulate to be €100[(1 + 0.06)¹⁰(1 - 0.30) + 0.30] = €155.36. Notice that this sum is greater than the €150.90 accumulated in the previous example using Equation 1, where returns are taxed annually at the same rate. This comparison illustrates the value of tax deferral.

Notice, as well, that the after-tax investment gain equals the pretax investment gain multiplied by one minus the tax rate. That is, €55.36 = €79.08 × (1 - 0.30). Whereas the tax drag on after-tax accumulations subject to annual accrual taxes compounds over time, the tax drag from deferred capital gains is a fixed percentage regardless of the investment return or time horizon. In other words, when deferral is permitted, the proportion of potential investment growth consumed by taxes is always the same as the tax rate, 30 percent in this case, which is less than that presented in Exhibit 2 when there was annual taxation.

Because the tax drag in Exhibit 2 increases with the investment return and time horizon, the value of a capital gain tax deferral also increases with the investment return and time horizon. One implication of the value of tax deferral is that investments taxed on a deferred capital gain basis can be more tax efficient (i.e., tax advantaged) than investments with returns that are taxed annually, all else equal, even if the marginal tax rate on the two is the same. Moreover, the difference compounds over time. The tax regime analysis from Exhibit 1 reveals that relatively few jurisdictions tax components of equity returns (dividends and capital gains) more heavily than interest income. There are rare exceptions where dividends (but usually not capital gains) are taxed to a greater extent than interest (such as the Heavy Dividend Tax Regime countries in Exhibit 1). Moreover, even if the tax rate on deferred capital gains is greater than the tax rate on interest income, the value of the deferral can more than offset a lower tax rate on annually taxed income, especially over time.

Exhibit 3 illustrates the value of tax deferral and its compounding effects more generally by presenting the ratio of after-tax accumulation in a deferred capital gain regime to after-tax accumulation in a regime in which returns are taxed annually. For example, with a 6 percent annual return, 20-year time horizon and a 30 percent tax rate, the accumulation of €100 in a deferred capital gain environment, is €100[(1 + 0.06)²⁰(1 - 0.30) + 0.30] = €254.50. In an annual taxation environment, it is €100[1 + 0.06(1 - 0.30)]²⁰ = €227.70. Therefore, a deferred capital gain environment accumulates €254.50/€227.70 = 1.118 times the amount accumulated in an annual taxation environment. The relative accumulations can be substantially larger when gains are deferred for long time horizons, especially for high returns. It is important to note, however, that the advantages of tax deferral can be offset or even eliminated if securities taxed on an accrual basis have greater risk-adjusted returns.

Exhibit 3 Ratio of Future Accumulations: Accumulation in a Deferred Capital Gain Environment to Accumulation in an Annual Taxation Environment

<i>r</i> (%)	Investment Horizon in Years (<i>n</i>)							
	5	10	15	20	25	30	35	40
2	1.001	1.004	1.008	1.015	1.023	1.033	1.045	1.058
4	1.003	1.014	1.031	1.056	1.086	1.123	1.165	1.213
6	1.007	1.030	1.067	1.118	1.181	1.257	1.346	1.447
8	1.012	1.050	1.113	1.198	1.305	1.432	1.582	1.754
10	1.018	1.075	1.169	1.294	1.453	1.644	1.871	2.136
12	1.025	1.104	1.232	1.405	1.624	1.892	2.214	2.598
14	1.033	1.137	1.303	1.529	1.818	2.177	2.616	3.149
16	1.041	1.172	1.380	1.666	2.035	2.500	3.080	3.799
18	1.050	1.210	1.464	1.814	2.273	2.862	3.612	4.561

Note: The calculations assume a 30 percent annual tax rate on investment returns and a 30 percent tax rate on deferred capital gains.

In many countries, the rate applied to capital gains is lower than the rate applied to interest income. In such cases, the investor gets a dual benefit from returns in the form of capital gains: deferral of taxation and a favorable tax rate when gains are realized. The capital gain tax rate may also vary depending on the holding period. Longer holding periods may receive a lower tax rate to encourage long-term rather than short-term investment. Australia, for example, taxes short-term gains (i.e., holding period less than 12 months) at ordinary rates. Only half the gains on assets held for more than 12 months are taxed, however, making the effective long-term capital gain tax rate half of the rate on ordinary income. In such cases the investor gets a dual benefit; deferral of taxation and a favorable rate on realized gains. The holding period can vary.

EXAMPLE 3**Deferred Capital Gains**

Assume the same facts as in Example 2. Kozloski invests €100,000 at 7 percent. However, the return comes in the form of deferred capital gains that are not taxed until the investment is sold in 20 years hence.

- 1 What is Kozloski's expected wealth at the end of 20 years?
- 2 What proportion of potential investment gains were consumed by taxes?

Solution to 1:

$$\begin{aligned}
 FV &= €100,000 \times FVIF_{cg} = €100,000 \times [(1 + 0.07)^{20}(1 - t) + t] \\
 &= €100,000 \times [(1 + 0.07)^{20}(1 - 0.20) + 0.20] = €329,575.
 \end{aligned}$$

Solution to 2:

Ignoring taxes, $FV = €100,000 [1 + 0.07]^{20} = €386,968$. The difference between this and the after-tax amount accumulated from above is €57,393. The proportion of potential investment gains consumed by taxes was $€57,393/€286,968 = 20.0$ percent. This result compares favorably to the potential investment gains consumed by taxes in Example 2.

3.1.3 Cost Basis

In taxation, cost basis is generally the amount that was paid to acquire an asset. It serves as the foundation for calculating a capital gain, which equals the selling price less the cost basis. The taxable gain increases as the basis decreases. In consequence, capital gain taxes increase as the basis decreases. In some circumstances, this basis may be adjusted under tax regulations or carry over from another taxpayer. The previous capital gains examples assume that cash is newly invested so that the cost basis was equal to the current market value. That is, the tax liability at the end of the investment horizon is based on the difference between the pretax ending value and the current market value today.

In many cases, an investment being evaluated today was purchased some time ago and has a cost basis that is different from the current market value. If a security has risen in value since its initial purchase, the cost basis may be less than its current market value. Cost basis affects an investment's after-tax accumulation because it determines the taxable capital gain. Specifically, the after-tax cash flow from liquidation increases as the cost basis increases, holding all else equal. Put differently, an investment with a low cost basis has a current embedded tax liability because, if it were liquidated today, capital gain tax would be owed even before future capital growth is considered. Newly invested cash has no such current tax liability.

If the cost basis is expressed as a proportion, B , of the current market value of the investment, then the future after-tax accumulation can be expressed by simply subtracting this additional tax liability from the expression in either Equation 2a or 2b. In other words,

$$FVIF_{cgb} = (1 + r)^n(1 - t_{cg}) + t_{cg} - (1 - B)t_{cg} \quad (3a)$$

Notice that if cost basis is equal to the current market value of the investment, then $B = 1$ and the last term simply reduces to Equation 2b. The lower the cost basis, however, the greater the embedded tax liability and the lower the future accumulation. Distributing and canceling terms produces

$$FVIF_{cgb} = (1 + r)^n(1 - t_{cg}) + t_{cg}B \quad (3b)$$

This form resembles Equation 2b, and the last term represents the return of basis at the end of the investment horizon. The lower the basis, the lower is the return of basis. For example, suppose an investment has a current market value of €100 and a cost basis of €80. The gain when realized will be subject to a capital gains tax of 30 percent. The cost basis is equal to 80 percent of the current market value of €100. If it grows at 6 percent for 10 years, the future after-tax accumulation is $€100 [(1.06)^{10}(1 - 0.30) + (0.30)(0.80)] = €149.36$, which is €6 less than the €155.36 accumulation that would result if the basis were equal to €100. The €6 difference represents the tax liability associated with the embedded capital gain.

EXAMPLE 4**Cost Basis**

Continuing with the facts in Examples 2 and 3, Kozloski has a current investment with a market value of €100,000 and cost basis of €80,000. The stock price grows at 7 percent per year for 20 years.

- 1 Express the cost basis as a percent of the current market value.
- 2 What is Kozloski's expected wealth after 20 years?

Solution to 1:

$$\text{Cost basis/Current market value} = B = €80,000/€100,000 = 0.80.$$

Solution to 2:

$$\begin{aligned} \text{FV} &= €100,000 \times FVIF_{cbg} \\ &= €100,000 \times [(1 + 0.07)^{20}(1 - 0.20) + 0.20(0.80)] \\ &= €325,575. \end{aligned}$$

This amount is €4,000 smaller than Kozloski's expected wealth in Example 3, in which it was assumed that the cost basis equaled the current market value.

3.1.4 Wealth-Based Taxes

Some jurisdictions impose a wealth tax, which is applied annually to a specific capital base. Often the wealth tax is restricted to real estate investments (e.g., Australia, Singapore, Belgium, Germany, and the United Kingdom). In other countries, it is levied on aggregate assets including financial assets above a certain threshold (e.g., Colombia). If limited to real estate holdings, the tax may be levied at the federal level or a municipal level. In any case, the wealth tax rate tends to be much lower than capital gains or interest income rates because it applies to the entire capital base—i.e., principal and return—rather than just the return.

The expression for an after-tax accumulation subject to a wealth tax is therefore different from the previous scenarios in which only incremental gains are taxed. If wealth is taxed annually at a rate of t_w , then after n years each unit of currency accumulates to

$$FVIF_w = [(1 + r)(1 - t_w)]^n \quad (4)$$

For example, if wealth capital is taxed at 2 percent, then €100 invested at 6 percent for ten years will grow to $[(1.06)(1 - 0.02)]^{10} = €146.33$. Because the form of a wealth tax differs from the form of taxes on either investment returns or deferred capital gains, this figure is not comparable to the previous two examples. This figure is substantially less than the pretax accumulation of €179.08, however. In other words, the two percent wealth tax consumed 41.4 percent of the investment growth that would have accrued over ten years in the absence of a wealth tax (i.e., $(€79.08 - €46.33)/€79.08$).

Exhibit 4 illustrates the impact of a wealth tax on investment growth for various rates of return and investment horizons. Because wealth taxes apply to the capital base, the absolute magnitude of the liability they generate (measured in units of currency) is less sensitive to investment return than taxes based on returns. Consequently, the proportion of investment growth that it consumes decreases as returns increase. Viewed differently, a wealth tax consumes a greater proportion of investment growth when returns are low. In fact, when returns are flat or negative, a wealth tax effectively reduces principal. Like the previous two types of taxes, however, the wealth tax consumes a greater share of investment growth as the investment horizon increases.

Exhibit 4 Proportion of Investment Growth Consumed by Wealth Taxes

<i>r</i> (%)	Investment Horizon in Years (<i>n</i>)							
	5	10	15	20	25	30	35	40
4	0.540	0.564	0.588	0.611	0.635	0.657	0.679	0.700
6	0.380	0.414	0.449	0.483	0.517	0.550	0.583	0.614
8	0.301	0.341	0.382	0.423	0.464	0.505	0.544	0.581
10	0.253	0.298	0.344	0.390	0.437	0.482	0.526	0.567
12	0.222	0.270	0.320	0.371	0.421	0.470	0.517	0.560
14	0.200	0.250	0.304	0.358	0.412	0.464	0.512	0.557
16	0.183	0.237	0.293	0.350	0.406	0.460	0.510	0.556
18	0.171	0.226	0.285	0.345	0.403	0.458	0.508	0.555

Note: The calculations assume a 2 percent annual wealth tax.

EXAMPLE 5

Wealth Tax

Olga Sanford lives in a country that imposes a wealth tax of 1.0 percent on financial assets each year. Her €400,000 portfolio is expected to return 6 percent over the next ten years.

- 1 What is Sanford's expected wealth at the end of ten years?
- 2 What proportion of investment gains was consumed by taxes?

Solution to 1:

$$FV = €400,000[(1.06)(1 - 0.01)]^{10} = €647,844.$$

Solution to 2:

Had the wealth tax not existed, $FV = €400,000(1.06)^{10} = €716,339$. This sum represents a €316,339 investment gain compared to a €247,844 gain in the presence of the wealth tax. Therefore, the one percent wealth tax consumed 21.65 percent of the investment gain (i.e., $(€316,339 - €247,844)/€316,339$).

3.2 Blended Taxing Environments

The discussion in the previous section is an oversimplification because each model assumes that investment gains were taxed according to only one of a number of possible taxes. In reality, portfolios are subject to a variety of different taxes depending on the types of securities they hold, how frequently they are traded, and the direction of returns. The different taxing schemes mentioned above can be integrated into a single framework in which a portion of a portfolio's investment return is received in the form of dividends (p_d) and taxed at a rate of t_d ; another portion is received in the form of interest income (p_i) and taxed as such at a rate of t_i ; and another portion is taxed as realized capital gain (p_{cg}) at t_{cg} . The remainder of an investment's return is

unrealized capital gain, the tax on which is deferred until ultimately recognized at the end of the investment horizon.⁵ These return proportions can be computed by simply dividing each income component by the total dollar return.

EXAMPLE 6

Blended Tax Environment

Zahid Kharullah has a balanced portfolio of stocks and bonds. At the beginning of the year, his portfolio has a market value of €100,000. By the end of the year, the portfolio was worth €108,000 before any annual taxes had been paid, and there were no contributions or withdrawals. Interest of €400 and dividends of €2,000 were reinvested into the portfolio. During the year, Kharullah had €3,600 of realized capital gains. These proceeds were again reinvested into the portfolio.

- 1 What percentage of Kharullah's return is in the form of interest?
- 2 What percentage of Kharullah's return is in the form of dividends?
- 3 What percentage of Kharullah's return is in the form of realized capital gain?
- 4 What percentage of Kharullah's return is in the form of deferred capital gain?

Solution to 1:

$$p_i = €400/€8,000 = 0.05 \text{ or } 5 \text{ percent.}$$

Solution to 2:

$$p_d = €2,000/€8,000 = 0.25 \text{ or } 25 \text{ percent.}$$

Solution to 3:

$$p_{cg} = €3,600/€8,000 = 0.45 \text{ or } 45 \text{ percent.}$$

Solution to 4:

Unrealized gain = €8,000 – €400 – €2,000 – €3,600 = €2,000. Expressed as a percentage of return, €2,000/€8,000 = 0.25, or 25 percent. The unrealized gain is the portion of investment appreciation that was not taxed as either interest, dividends, or realized capital gain.

In this setting, the annual return after realized taxes can be expressed as

$$r^* = r(1 - p_i t_i - p_d t_d - p_{cg} t_{cg})$$

In this case, r represents the pre-tax overall return on the portfolio. From the preceding example, note that the pre-tax return was 8 percent $[(€108,000/€100,000) - 1]$, however there would be taxes due on the interest, dividends and realized capital gains. The effective annual after-tax return, r^* , reflects the tax erosion caused by a portion of the return being taxed as ordinary income and other portions being taxed as realized capital gain and dividends. It does not capture tax effects of deferred unrealized capital

⁵ Capital gains are almost always taxed when recognized. Some countries, such as Denmark and Australia, however, impose an exit tax on some unrealized gains for residents who become non-residents. In Canada, capital gains are taxed at death as if realized unless the property is transferred to a surviving spouse.

gains. One can view this expression as being analogous to the simple expression in which after-tax return equals the pretax return times one minus the tax rate. The aggregate tax rate has several components in this case, but the intuition is the same.⁶

EXAMPLE 7

Blended Tax Environment: After Tax Return

Continuing with the facts in Example 6, assume that dividends and realized capital gains are taxed at 15 percent annually while interest is taxed at 35 percent annually.

- 1 What is the annual return after realized taxes?
- 2 Assuming taxes are paid out of the investment account, what is the balance in the account at the end of the first year?

Solution to 1:

$$\begin{aligned} r^* &= r(1 - p_i t_i - p_d t_d - p_{cg} t_{cg}) \\ &= 8\%[1 - (0.05 \times 0.35) - (0.25 \times 0.15) - (0.45 \times 0.15)] \\ &= 7.02\% \end{aligned}$$

Solution to 2:

Using the income data from above,

Income Type	Income Amount (€)	Tax Rate (%)	Tax Due (€)
Interest	400	35	140
Dividends	2,000	15	300
Realized capital gains	3,600	15	<u>540</u>
Total tax due			980

After paying taxes there would be €107,020 in the account (€108,000 – €980). Note that this is consistent with the 7.02 percent return computed for the first question.

A portion of the investment return has avoided annual taxation, and tax on that portion would then be deferred until the end of the investment horizon. Holding the tax rate on capital gains constant, the impact of deferred capital gain taxes will be diminished as more of the return is taxed annually in some way as described above. Conversely, as less of the return is taxed annually, more of the return will be subject to deferred capital gains. One can express the impact of deferred capital gain taxes using an effective capital gain tax rate that adjusts the capital gains tax rate t_{cg} to reflect previously taxed dividends, income, or realized capital gains. The effective capital gains tax rate can be expressed as⁷

$$T^* = t_{cg}(1 - p_i - p_d - p_{cg}) / (1 - p_i t_i - p_d t_d - p_{cg} t_{cg})$$

⁶ This expression could be expanded to incorporate any number of different taxable components, such as a different rate for short term capital gains or special treatment of certain types of taxable income. The general principle is that a portfolio can generate return in different forms, each of which may be taxed differently.

⁷ Horan and Peterson (2001) and Horan (2002) provide more thorough developments of these expressions.

The adjustment to the capital gains tax rate takes account of the fact that some of the investment return had previously been taxed as interest income, dividends, or realized capital gain before the end of the investment horizon and will not be taxed again as a capital gain.

The future after-tax accumulation for each unit of currency in a taxable portfolio can then be represented by

$$FVIF_{Taxable} = (1 + r^*)^n(1 - T^*) + T^* - (1 - B)t_{cg} \quad (5)$$

Although this formulation appears unwieldy, $(1 + r^*)^n(1 - T^*) + T^*$ is analogous to the after-tax accumulation for an investment taxed entirely as a deferred capital gain in Equation 3. The only difference is that r^* is substituted for r , and T^* is substituted for t_{cg} in most places.⁸

Different assets and asset classes generate different amounts of return as interest income, dividends, or capital gain, and will thus have different values for p_i , p_d , and p_{cg} .⁹ Moreover, Equation 5 can replace the equations introduced in the previous sections. For example, the return on a hypothetical taxable bond with no capital appreciation or depreciation over the course of a tax year might be taxed entirely at ordinary rates so that $p_i = 1$, $p_d = 0$, and $p_{cg} = 0$. If the cost basis is equal to market value (i.e., $B = 1$), the expression for the after-tax future value simply reduces to $[1 + r(1 - t_i)]^n$.

On the other hand, the return for a passive investor with a growth portfolio of non-dividend paying stocks and no portfolio turnover may be entirely tax-deferred such that $p_d = 0$, $p_i = 0$ and $p_{cg} = 0$, and the future value reduces to $(1 + r)^n(1 - t_{cg}) + t_{cg}$. The return for an active investor with a similar growth portfolio might be composed entirely of realized long-term capital gains and taxed annually at t_{cg} in which case $p_d = p_i = 0$ and $p_{cg} = 1$, and the after-tax future value is $[1 + r(1 - t_{cg})]^n$.

Most accounts conform to none of these extremes, but can be accommodated by simply specifying the proper distribution rates for interest income, dividends, and capital gain. It is useful then to have an understanding of how investment style affects the tax-related parameters (e.g., p_i , p_d , and p_{cg}).

EXAMPLE 8

Blended Tax Environment: Future Long Term Accumulation

Continuing with the facts in the previous example, assume there is a five-year investment horizon for the account. Annual accrual taxes will be paid out of the account each year with the deferred tax on previously unrealized capital gains paid at the end of the five-year horizon. The account is rebalanced annually. Consider a €100,000 portfolio with the return and tax profile listed in Panel A of Exhibit 5. What is the expected after-tax accumulation in five years?

Exhibit 5 Hypothetical Tax Profile

Panel A: Tax Profile		
	Annual Distribution Rate (p)	Tax Rate (T)
Ordinary Income (i)	5%	35%
Dividends (d)	25%	15%

⁸ Although Equation 5 ignores the wealth tax, it could be modified to incorporate it.

⁹ Equation 5 does not replace the equation for the wealth tax. It can be modified, however, to do so.

Exhibit 5 (Continued)

Panel A: Tax Profile		
	Annual Distribution Rate (p)	Tax Rate (T)
Capital Gain (cg)	45%	15%
Investment Horizon (n)		5 years
Average Return (r)		8%
Cost Basis		€100,000
Panel B: Intermediate Accumulation Calculations		
Annual after-tax return (r^*)		7.02%
Effective capital gains tax rate (T^*)		4.27%

In this case, 25 percent of the return is composed of dividends; 5 percent is composed of interest; and 45 percent is composed of realized long-term gains. These figures imply that the remaining 25 percent (i.e., $1 - 0.05 - 0.25 - 0.45$) of portfolio returns are deferred capital gains and not taxed until the end of the investment horizon.

The annual return after realized taxes, r^* , is $0.08[1 - (0.05)(0.35) - (0.25)(0.15) - (0.45)(0.15)] = 7.02$ percent as computed previously. This figure reflects the annual return after having accounted for the tax drag imposed by annually levied taxes on the portion of return composed of elements like dividends, interest, and realized capital gains. It does not take into account, however, tax obligations from gains not yet realized; that effect is considered in the effective capital gains tax rate, T^* , which equals $0.15[(1 - 0.05 - 0.25 - 0.45)/(1 - 0.05 \times 0.35 - 0.25 \times 0.15 - 0.45 \times 0.15)] = 0.15(0.25/0.8775) = 4.27$ percent. The figure is relatively low in this example because a relatively small proportion of return, 25 percent, is subject to deferred capital gains tax.

Because the cost basis and the current market value portfolio are both €100,000, the cost basis expressed as a percent of current market value is 1.00. Substituting these intermediate results into Equation 5, the expected future accumulation of the portfolio in 5 years equals $€100,000[(1 + r^*)^n(1 - T^*) + T^* - (1 - B)t_{cg}] = €100,000[(1.0702)^5(1 - 0.0427) + 0.0427 - (1 - 1.00)0.15] = €138,662$.

3.3 Accrual Equivalent Returns and Tax Rates

Because returns can come in various forms and be taxed in various ways, an overall understanding of the impact of taxes on return can be obscure. A useful way to summarize the impact of taxes on portfolio returns is to calculate an accrual equivalent after-tax return. Conceptually, an accrual equivalent after-tax return is the tax-free return that, if accrued annually, produces the same after-tax accumulation as the taxable portfolio.¹⁰ For example, in the previous example Kharullah's €100,000 portfolio earned an 8 percent return before taxes and will grow to €138,662 over a 5 year period after accrued and deferred taxes are considered. The tax-free return that will accumulate

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¹⁰ This term is coined by Poterba (2000).

€138,662 over 5 years is the accrual equivalent return. The difference between the accrual equivalent return and the taxable return of 8 percent is a measure of the tax drag imposed on the portfolio.

An analogous way to measure tax drag is with the accrual equivalent tax rate. An accrual equivalent tax rate finds the annual accrual tax rate (of the simple form described in Section 3.1.1) that would produce the same after-tax accumulation as a tax system based in whole or in part on deferred realized gains (such as those described in Sections 3.1.2 or 3.2). Both these concepts recognize that deferring taxes through unrealized gains does not eliminate the tax liability but moves its payment through time.

3.3.1 Calculating Accrual Equivalent Returns

Calculating accrual equivalent returns is straightforward. In the previous example, the €100,000 portfolio has an after-tax accumulation 5 years hence of €138,662. The accrual equivalent return is found by solving for the return that equates the standard future value formula to the after-tax accumulation and solving for the return. In this example, we solve the following equation for R_{AE} :

$$€100,000(1 + R_{AE})^5 = €138,662$$

The accrual equivalent return, R_{AE} , is 6.756 percent. Notice that this rate is less than the annual return after realized taxes, r^* , of 7.02 percent because the accrual equivalent return incorporates the impact of deferred taxes on realized gains as well as taxes that accrue annually. The accrual equivalent return is always less than the taxable return, r . It approaches the annual return after realized taxes, however, as the time horizon increases. This phenomenon demonstrates the value of tax deferral. The value of deferral in this example is relatively modest, however, because only 25 percent of the tax obligation associated with the return is assumed to be deferred. If more of the return is in the form of deferred gains, the value of the deferral increases.

3.3.2 Calculating Accrual Equivalent Tax Rates

The accrual equivalent tax rate is derived from the accrual equivalent return. It is the hypothetical tax rate, T_{AE} , that produces an after-tax return equivalent to the accrual equivalent return. In our example, it is found by solving for T_{AE} in the following expression:

$$r(1 - T_{AE}) = R_{AE} \tag{6}$$

In the blended tax regime example, $0.08(1 - T_{AE}) = 0.06756$. Solving for T_{AE} , the accrual equivalent tax rate is therefore, 0.1555 or 15.55 percent. This rate is much lower than the marginal tax rate on ordinary income and only slightly higher than the favorable rate on dividends and capital gains in this example because a relatively small portion (i.e., 5 percent) of the portfolio's return is generated from highly taxed income. Most of the return receives preferential tax treatment in either the form of a reduced rate for dividends or a reduced rate on realized capital gains combined with valuable deferral for unrealized gains. As a result, investments with this tax profile are relatively tax efficient. The accrual equivalent tax rate would increase if either the return had a larger component taxed at ordinary rates, or if dividends and capital gains received less favorable treatment. In either case, R_{AE} would be smaller, implying a higher value of T_{AE} for a given level of pretax return r in Equation 6.

The accrual equivalent tax rate can be used in several ways. First, it can be used to measure the tax efficiency of different asset classes or portfolio management styles. Second, it illustrates to clients the tax impact of lengthening the average holding periods of stocks they own. Third, it can be used to assess the impact of future tax law changes. If the client's tax rate is likely to change in the future, the manager can determine the impact of the expected change on the accrual equivalent tax rate. The future tax rate could change for several reasons such as tax law changes, changes in

client circumstances, or the client taking advantage of tax rules designed to encourage certain behaviors such as charitable contributions which may be deductible in some tax regimes.

EXAMPLE 9

Accrual Equivalent Return

We extend Example 3 with the same facts repeated here: Vladimir Kozloski is determining the impact of taxes on his expected investment returns and wealth accumulations. Kozloski lives in a tax jurisdiction with a flat tax rate of 20 percent, which applies to all types of income and is taxed annually. He expects to earn 7 percent per year on his investment over a 20-year time horizon and has an initial portfolio of €100,000. The 7 percent return is expected to come from deferred capital gains, which are not taxed until sold in 20 years. Kozloski's expected wealth at the end of 20 years is:

$$\begin{aligned} FV &= €100,000 \times FVIF_{cg} = €100,000 \times [(1 + 0.07)^{20}(1 - 0.2) + 0.2] \\ &= €329,575 \end{aligned}$$

- 1 What is the accrual equivalent return?
- 2 What is the accrual equivalent tax rate?

Solution to 1:

$$\begin{aligned} €100,000(1 + R_{AE})^{20} &= €329,575 \\ R_{AE} &= 6.1446 \text{ percent} \end{aligned}$$

Kozloski would be just as well off if he could find a tax-free investment earning 6.1446 percent.

Solution to 2:

$$\begin{aligned} 0.07(1 - T_{AE}) &= 0.061446 \\ T_{AE} &= 12.22 \text{ percent} \end{aligned}$$

This rate is lower than the stated tax rate on dividends because there is an advantage from the deferral of taxes.

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TYPES OF INVESTMENT ACCOUNTS

4

The previous section examined models for taxable accounts in which the tax profile was determined by the asset class and/or the portfolio management style. The impact of taxes on future accumulations often depends heavily on the type of account in which assets are held. Many countries have account structures with different tax profiles designed to provide some relief to the taxable investor. These structures are often intended to encourage retirement savings, but may also accommodate savings for health care and education. Most industrialized and developing countries have tax incentives to encourage retirement savings. An international survey of 24 industrialized and developing countries commissioned by the American Council for Capital Formation

(ACCF) indicates that tax-advantaged savings accounts are offered to taxpayers by two-thirds of the countries surveyed, including Australia, Canada, Germany, Italy, the Netherlands, and the United Kingdom.¹¹

Most types of investment accounts can be classified into three categories. The first type is taxable accounts. Investments to these accounts are made on an after-tax basis and returns can be taxed in a variety of ways as discussed in the previous section. A second class of accounts can be called tax-deferred accounts, or TDAs. Contributions to these accounts may be made on a pretax basis (i.e., tax-deductible), and the investment returns accumulate on a tax-deferred basis until funds are withdrawn at which time they are taxed at ordinary rates. As such, these accounts are sometimes said to have front-end loaded tax benefits. All but one of the countries in the ACCF study have some kind of retirement account that permits tax deductible contributions. In Canada they are called Registered Retirement Savings Plans (RRSPs), and in the United States some are called Individual Retirement Accounts (IRAs). In some countries, like Australia and Chile, individuals are mandated to contribute a fixed proportion of their income to these accounts. Many types of defined contribution pension plans, whether sponsored by the state or an employer, fall into this category. Argentina, for example, offers citizens the option to make contributions to a public pension fund company.

A third class of accounts has back-end loaded tax benefits. These accounts can be called tax-exempt (at least on a forward-looking basis) because although contributions are not deductible, earnings accumulate free of taxation even as funds are withdrawn, typically subject to some conditions. An example is the Roth IRA in the United States.

4.1 Tax-Deferred Accounts

Assets held in a TDA accumulate on a tax deferred basis. Tax is owed when funds are withdrawn at the end of an investment horizon at which time withdrawals are taxed at ordinary rates or another rate, T_n , prevailing at the end of the investment horizon. The future after-tax accumulation of a contribution to a TDA is therefore equal to

$$FVIF_{TDA} = (1 + r)^n(1 - T_n) \quad (7)$$

The form of Equation 7 is similar to the future value interest factor when tax is based entirely on capital gains that are recognized at the end of the investment horizon with a cost basis equal to zero (see Equation 3).

4.2 Tax-Exempt Accounts

Tax-exempt accounts have no future tax liabilities. Earnings accumulate without tax consequence and withdrawals create no taxable event. Therefore, the future accumulation of a tax-exempt account is simply

$$FVIF_{TaxEx} = (1 + r)^n \quad (8)$$

Potential insights are available in comparing Equations 7 and 8. First, we notice that $FVIF_{TDA} = FVIF_{TaxEx}(1 - T_n)$, which means that future after-tax accumulation of assets held in a tax deferred account are less than the after-tax accumulation of the same assets when held in a tax-exempt account regardless of the type of asset (assuming equivalent returns). Put simply, assets in a TDA have a built-in tax liability whereas assets in a tax-exempt account do not. It can be shown that the value of an asset held in a TDA measured on an after-tax basis is therefore equal to $(1 - T_n)$ times the value

¹¹ American Council for Capital Formation, "An International Comparison of Incentives for Retirement Saving and Insurance" (June 1999).

of the same asset held in a tax-exempt account. The taxing authority essentially owns T_n of the principal value of a TDA, regardless of the type of asset held in it, leaving the investor effectively owning only $(1 - T_n)$ of the principal.

EXAMPLE 10

Comparing Accumulations of Account Types

Extending Examples 2 and 3, recall that Vladimir Kozloski lives in a tax jurisdiction with a flat tax rate of 20 percent which applies to all types of income. Kozloski expects to earn 7 percent per year on his investment over a 20 year time horizon and has an initial portfolio of €100,000. Assume that Kozloski has the following current investments:

- 1 €100,000 invested in a taxable account earning 7 percent taxed annually
- 2 €100,000 invested in a taxable account earning 7 percent deferred capital gains (cost basis = €100,000)
- 3 €100,000 invested in a tax deferred account earning 7 percent
- 4 €100,000 invested in a tax exempt account earning 7 percent

Compute the after-tax wealth for each account at the end of 20 years assuming all assets are sold and accounts liquidated at the end of 20 years and assuming a tax rate of 20 percent.

Solution to 1:

$$FV = €100,000[1 + 0.07(1 - 0.20)]^{20} = €297,357$$

Solution to 2:

$$FV = €100,000[(1 + 0.07)^{20}(1 - 0.20) + 0.20] = €329,575$$

Solution to 3:

$$FV = €100,000[(1 + 0.07)^{20}(1 - 0.20)] = €309,575$$

Solution to 4:

$$FV = €100,000[(1 + 0.07)^{20}] = €386,968$$

4.3 After-Tax Asset Allocation

The notion that a TDA is worth $(1 - T_n)$ times an otherwise equivalent tax-exempt account has implications for after-tax asset allocation, which is the distribution of asset classes in a portfolio measured on an after-tax basis. Consider, for example, an investor with €1,500,000 worth of stock held in a TDA and €500,000 of bonds held in a tax-exempt account as displayed in Exhibit 6. Withdrawals from the TDA account will be taxed at 40 percent. A traditional view of asset allocation based on pretax values would suggest the investor has €2,000,000 of assets, 75 percent of which are allocated in stocks and 25 percent of which are allocated in bonds. In after-tax terms, however, the total portfolio is worth only €1,400,000 because the TDA has a built-in tax liability of €600,000, money the investor cannot spend. Moreover, because

the investor is holding stock in the TDA, her after-tax equity exposure is less than a pretax analysis would suggest. Specifically, the after-tax equity allocation is only 64.3 percent rather than 75 percent.¹²

Exhibit 6 Simple Example of After-Tax Asset Allocation

Account Type	Asset Class	Pretax Market Value (€)	Pretax Weights (%)	After-Tax Market Value (€)	After-Tax Weights (%)
TDA	Stock	1,500,000	75	900,000	64.3
Tax-Exempt	Bonds	500,000	25	500,000	35.7
Total Portfolio		2,000,000	100	1,400,000	100

Note: Withdrawals at the end of the investment horizon are assumed to be taxed at a rate of 40 percent.

This simple example excludes taxable accounts and does not depend on an investor's time horizon. However, the after-tax value of taxable accounts may depend on an investor's time horizon, which can be difficult to estimate and may change over time. Therefore, estimating an investor's time horizon presents a potential impediment to incorporating after-tax asset allocation in portfolio management. Another challenge is improving client awareness, understanding, and comfort with asset allocation from an after-tax perspective. Suppose an adviser increases pretax equity exposure to achieve a target after-tax asset allocation. Her client may have difficulty accepting the notion of after-tax asset allocation, especially in a bear market when the extra equity exposure would hinder performance.

4.4 Choosing Among Account Types

A euro invested in a tax-exempt account always has a higher after-tax future value than a euro invested in a TDA, all else equal. Based on this, one may infer that it is always better to save in a tax-exempt account instead of a TDA. That conclusion would be premature, however, because the comparison overlooks the fact that contributions to TDAs are often tax-deductible whereas contributions to the tax-exempt accounts considered here generally are not.

Let's compare after-tax future values of contributions of a *pretax* euro to a tax-exempt account and a TDA. Because contributions to a tax-exempt account are taxable, a pretax investment is reduced by taxes such that the after-tax investment is $(1 - T_0)$, where T_0 is the tax rate applicable to the initial pretax contribution. The future value of a pretax dollar invested in a tax-exempt account is therefore $(1 - T_0)(1 + r)^n$. This expression reflects that taxes reduce the initial investment. The future value of a pretax dollar invested in a TDA is $(1 + r)^n(1 - T_n)$ because withdrawals are taxed at T_n . The only difference between the equations is the beginning and ending tax rates. The tax-exempt account is taxed at today's rate, T_0 , while the TDA is eventually taxed at the tax rate in the withdrawal year, T_n . Therefore, comparing the attractiveness of the two types of accounts reduces to comparing the tax rate today to the expected tax rate when funds are withdrawn. If the prevailing tax rate when funds are withdrawn is less than the tax rate when they are invested, the TDA will accumulate more after-tax wealth than the tax-exempt account, and vice versa.

¹² Reichenstein (1998, 2001, 2006, 2007) and Horan (2007a and 2007b) develop the concept of after-tax asset allocation in more detail.

For example, consider an investor currently in the 40 percent tax bracket who is willing to forego €1,200 of spending this year. He could invest €2,000 pretax dollars in a TDA or €1,200 after taxes in a tax-exempt account. Both investments will reduce this year's spending by €1,200 because the €2,000 TDA contribution would reduce this year's taxes by €800. He invests in an asset that earns a 5 percent annual return for ten years. Assuming his tax rate is unchanged, in ten years, the TDA will be worth $€2,000(1.05)^{10}(1 - 0.40) = €1,955$ after taxes. The tax-exempt account will be worth $€1,200(1.05)^{10} = €1,955$, the same as the TDA.

In this example, he could invest €2,000 in the TDA or €1,200 in the tax-exempt account; a contribution limit did not affect his choice of account type. However, annual contribution limits are usually expressed as a set amount whether the contribution is made with pretax or after-tax funds. A €2,000 contribution of after-tax funds to a tax-exempt account is effectively a larger contribution than a €2,000 contribution of pretax funds to a TDA. As a result, the tax-exempt account allows the investor to put more after-tax funds in a tax-sheltered account than a TDA, all else equal. Horan (2003, 2005) developed a more general approach that incorporates contribution limits in the balance of considerations.

Suppose, however, that the investor's tax rate upon withdrawal will be 20 percent, which is lower than his current tax rate. The future value of the €1,200 contribution to tax-exempt accumulation is unchanged at €1,955, but the TDA accumulation increases to €2,606 or $2,000(1.05)^{10}(1 - 0.20)$ making the TDA the better choice. The decision would be reversed if the tax rate at withdrawal exceeds the current tax rate.

EXAMPLE 11

Choosing Among Account Types

Bettye Mims would like to invest for retirement and is willing to reduce this year's spending by €3,000. She will invest €3,000 *after taxes* this year and is in a 25 percent tax bracket, which is the top marginal tax rate in her jurisdiction. Mims is considering three types of accounts but would invest in the same portfolio which is expected to have a pre-tax return of 6 percent annually. If invested in a taxable account the income would be taxed each year at the same 25 percent rate.

Assuming Mims will make a single contribution today and withdraw all funds—paying any necessary taxes in 30 years—which of the following accounts will result in the largest after-tax accumulation?

- *Account A.* A taxable account with an initial investment of €3,000.
- *Account B.* A tax deferred account, where Mims can make a €4,000 tax deductible contribution (a €3,000 after tax cost to Mims).
- *Account C.* A tax exempt account, where a €3,000 contribution is not deductible.

Solution:

The taxable account would accumulate €11,236 after taxes:

$$\text{For A, FV} = €3,000[1 + 0.06(1 - 0.25)]^{30} = €11,236$$

The tax deferred account would accumulate €17,230 after taxes:

$$\text{For B, FV} = €4,000[(1 + 0.06)^{30}(1 - 0.25)] = €17,230$$

The tax exempt account would also accumulate €17,230 after taxes:

$$\text{For C, FV} = €3,000[(1 + 0.06)^{30}] = €17,230$$

Both B and C achieve the same after-tax accumulation assuming her tax rates in the contribution year and withdrawal year are the same.

5

TAXES AND INVESTMENT RISK

It is fairly obvious that taxes reduce returns. Less obvious is the impact of taxes on investment risk. A fundamental premise regarding taxes and risk is that, by taxing investment returns, a government shares risk as well as return with the investor. Because the returns on assets held in TDAs and tax-exempt accounts are not currently taxed, investors bear all of the risk associated with returns in these accounts. Even in the case of TDAs in which the government effectively owns T_n of the principal, the variability of an investor's return in relation to the current after-tax principal value is unaffected by the tax on withdrawals.¹³

Because the returns on assets held in taxable accounts are typically taxed annually in some way, investors bear only a fraction of the risk associated with these assets. Suppose asset returns are taxed entirely as ordinary income at a rate of t_i . If the standard deviation of pretax returns is σ , returns are fully taxed at ordinary rates (and all investment losses can be recognized for tax purposes in the year they are incurred), then the standard deviation of after-tax returns for a taxable account is $\sigma(1 - t_i)$. That is, an investor bears only $(1 - t_i)$ of the pretax risk.

This concept is best demonstrated by way of example. Consider a €100,000 investment with an expected return of 10 percent, which is taxed annually at 40 percent. A three-state probability distribution of equally likely outcomes is presented in Exhibit 7. The standard deviation of pretax returns is 12.25 percent. The after-tax accumulations one year hence and the after-tax returns are presented in the last two columns.¹⁴

Exhibit 7 Simple Example of Investment Risk and Taxes

Outcome	Prob.	Pretax Accumulation (€)	Pretax Return (%)	After-Tax Accumulation (€)	After-Tax Returns (%)
Good	1/3	125,000	25	115,000	15
Average	1/3	110,000	10	106,000	6
Bad	1/3	95,000	-5	97,000	-3
Exp. Value		110,000	10	106,000	6
Std. Dev. (σ)			12.25		7.35

Note: Investment returns are assumed to be taxed at a rate of 40 percent in the year they are earned.

¹³ For example, the after-tax accumulation of €1 in a TDA that earns a pretax return of r for n years is $(1 + r)^n(1 - T_n)$. The euro can be conceptually separated into $(1 - T_n)$ of the investor's funds plus T_n , the taxing authority's portion of the current principal. The investor's portion grows tax exempt from $(1 - T_n)$ today to $(1 + r)^n(1 - T_n)$ at withdrawal.

¹⁴ Readers will recognize that this analysis assumes symmetry in the tax system. That is, the €5,000 pretax loss in the bad state is partially offset by a €2,000 tax deduction in the same way a pretax gain is partially offset by a tax liability. Some jurisdictions do not build this symmetry into the tax code or may at least place restrictions on the amount of losses that can be used to reduce taxes. These complexities are not considered here.

The standard deviation of after-tax returns equals 7.35 percent, which also equals $0.1225(1 - 0.40)$. In other words, taxes absorbed t_{oi} of the pretax volatility; the after-tax volatility is $(1 - t_{oi})$ of the pretax volatility. As a result, the taxes not only reduce an investor's returns, but also absorb some investment risk. This concept has implications for portfolio optimization discussed below.

To see how taxes affect after-tax risk in a portfolio context, consider an investor with 50 percent of her wealth invested in equities and 50 percent invested in fixed income, both held in taxable accounts. The equity has a pretax standard deviation of 20 percent and is relatively tax-efficient such that all returns are taxed each year at a 20 percent tax rate. The fixed income is also taxed annually but at a 40 percent rate with pretax volatility of 5 percent. If the two asset classes are perfectly correlated, the pretax portfolio volatility is $0.50(0.20) + 0.50(0.05) = 0.125 = 12.5$ percent. On an after-tax basis, however, portfolio volatility is $0.50(0.20)(1 - 0.20) + 0.50(0.05)(1 - 0.40) = 0.095 = 9.5$ percent. This example illustrates that annually paid taxes reduce portfolio volatility.¹⁵

Alternatively, suppose that the equity is held in a taxable account and the fixed income is held in a tax-exempt account like those described in the previous section. In this case, the investor absorbs all of the bond volatility in the tax-exempt account, and the new portfolio volatility is $0.50(0.20)(1 - 0.20) + 0.50(0.05) = 0.105 = 10.5$ percent. After-tax volatility increased from the previous measure of after-tax volatility of 9.5 percent because one of the assets (bonds) became tax sheltered. The government therefore absorbed less investment risk through taxes, and the investor is left bearing more investment risk.

IMPLICATIONS FOR WEALTH MANAGEMENT

6

The concepts introduced above have several important implications for financial analysts and portfolio managers. The value created by using investment techniques that effectively manage tax liabilities is sometimes called tax alpha. This section briefly discusses some opportunities for considering taxation in the management of individual's portfolios and tax-planning opportunities to maximize the after-tax accumulation of wealth.

6.1 Asset Location

In most tax regimes, a security's asset class determines its tax profile when held in taxable accounts. Interest income on fixed income securities are often taxed differently from capital gains on stocks, for example. We have also seen how the account structure (e.g., TDAs or tax-exempt accounts) can override this tax treatment. Further, investments in TDAs and tax-exempt accounts are limited such that investors may not place all of their investments in these types of accounts. Investors, therefore, often have multiple types of accounts (e.g., taxable, TDAs, and tax-exempt) when tax advantaged accounts are permitted. An interaction exists between deciding what assets to own and in which accounts they should be held. The choice of where to place specific assets is called the asset location decision. It is distinct from the asset allocation decision.

¹⁵ The arithmetic is somewhat more complicated when the two assets are not perfectly correlated in which case one would use the standard expression for the volatility of a two security portfolio, $\sigma_p = (w_a^2\sigma_a^2 + w_b^2\sigma_b^2 + 2w_aw_b\rho\sigma_a\sigma_b)^{1/2}$. The general point that taxes reduce portfolio volatility remains unaffected.

A well designed portfolio not only prescribes a proper asset allocation but simultaneously tells the portfolio manager the proper location for those assets. This section presents some valuable intuition and general guidance derived from the literature.

Much of the intuition is based on an arbitrage argument developed for corporate pension fund policy by Black (1980) and Tepper (1981). Suppose contributions to a pension plan are tax-deductible and the returns on pension assets are exempt from tax, much like a TDA for an individual investor. The basic idea behind the arbitrage argument is that a company should place assets that would otherwise be heavily taxed assets within the tax shelter of the pension fund, and locate more lightly taxed securities outside the pension fund. If this strategy causes the allocation of the heavily taxed asset held in the pension fund to be too high, an offsetting short position in the heavily taxed asset outside the pension fund can offset the excessive exposure in the pension fund.

For example, suppose bonds are more heavily taxed than equity. Moreover, suppose filling a company's pension fund with bonds causes an excessive allocation to bonds. The company can borrow (i.e., short bonds) outside the pension fund and invest the proceeds in equities. In this way, lending (i.e., investing in bonds) in the pension fund offsets borrowing outside the pension fund, allowing the company to achieve the desired overall asset allocation. The exact amount of borrowing required to offset the fixed-income investment in the pension fund depends on the tax rate and how assets are taxed, but the concept remains the same.

This same logic applies to individual investors. That is, investors would place in TDAs and tax-exempt accounts those securities that would otherwise be heavily taxed if held in taxable accounts (e.g., securities subject to high tax rates and/or annual taxation). The taxable account would hold lightly taxed assets (e.g., securities subject to low rates and/or tax deferral). For example, suppose an investor has €100,000 in tax-deferred accounts and €25,000 in taxable accounts as in Exhibit 8. As suggested, the €100,000 of bonds is placed in the TDA, and €25,000 of stock is placed in the taxable account, creating a pretax bond allocation of 80 percent. Suppose that the target pretax allocation is 60 percent bonds and 40 percent stocks. The investor would borrow €25,000 and purchase additional stock in the taxable account for a total of €50,000 stock. The overall asset allocation is €75,000 bonds and €50,000 stock, which attains the target allocation of 60 percent bonds and 40 percent stock.¹⁶

Exhibit 8 Simple Example of Asset Location

Account Type	Asset Class	Existing Pretax Market Value (€)	Existing Pretax Allocation (%)	Asset Class	Target Pretax Market Value (€)	Target Pretax Allocation (%)
TDA	Bond	100,000	80	Bond	100,000	80
Taxable	Stock	25,000	20	Stock	50,000	40
				Short Bond	(25,000)	(20)
Total		125,000	100		125,000	100

¹⁶ In this example, asset allocation is expressed in pretax terms. Technically, the asset location question should be solved jointly with asset allocation because changing locations changes asset allocation in after-tax terms. We abstract from that complexity in this example and the following examples for illustrative ease.

There are limitations to this basic arbitrage argument. Investors may face restrictions on the amount and form of borrowing. For instance, the tax arbitrage argument assumes that investors can borrow and lend at the same rate in whatever amounts they wish. In reality, this is not the case. Investors are undoubtedly subject to borrowing costs that are greater than the yield on a bond of similar risk. At least a portion of the tax gains from the arbitrage are therefore consumed by this rate differential. Moreover, behavioral constraints can limit implementation because some investors are apprehensive about borrowing money (i.e., shorting bonds) to manage their retirement portfolio.

In addition, investors may face liquidity constraints (e.g., margin requirements or withdrawal penalties from TDAs and tax-exempt accounts) that would make the arbitrage strategy costly. For example, margin rules may preclude investors from borrowing as much as the arbitrage strategy would suggest or force them to borrow at rates in excess of the bond returns in the TDA. In some jurisdictions investors face penalties for withdrawing assets held in a TDA or tax-exempt account prior to a particular date. If the equity in a taxable account suffers a substantial decline in value, an investor may be forced to liquidate assets in the tax-deferred account to finance consumption, which may trigger an early withdrawal penalty for some investors. These constraints may make strictly executing the arbitrage strategy costly or impossible.

In these cases, asset location is still important. If there are constraints to borrowing in the taxable account then the investor may hold €25,000 in stocks in the taxable account. In the TDA, she could hold €75,000 in bonds and €25,000 in stocks in the TDA. This would achieve the target allocation, while following the location preference in the absence of borrowing.

Separately, suppose she has borrowing constraints and needs €5,000 as a cash reserve in her taxable account. She could hold €20,000 in stocks and €5,000 in cash in the taxable account. In the TDA, she could hold €70,000 in bonds and €30,000 in stocks, which would achieve her target asset allocation. In each example, she follows the asset location preference to the extent possible, while satisfying her other constraints and target asset allocation.

Some jurisdictions exempt municipal bond interest or other types of interest from taxes. In this case, it could conceivably make sense to place tax-free municipal bonds in a taxable account and more heavily taxed stock in the TDA. The yield on tax-free bonds, however, is generally much lower than those on taxable bonds so that in a well functioning market their after-tax returns are approximately equal. This yield concession is a significant disadvantage to placing low yielding tax-free bonds in a taxable account and equity in a TDA. In most instances the yield concession more than offsets the value of sheltering equity returns from taxes. As a result, it is generally better to follow the general strategy of locating bonds in TDAs and equity in taxable accounts.¹⁷

The tax regime governing the investor determines the relative importance of asset location. In a regime where all income is taxed annually (including unrealized capital gains) and at the same rates, asset location would not matter. As noted earlier, however, these regimes are rare. In most regimes the individual tax structure should be examined to determine which assets are taxed annually and highly versus those that are tax deferred or taxed lightly. Additionally, investment style impacts how an asset or asset class is taxed. For example, active management (discussed further below) or a covered call strategy for an equity portfolio may eliminate the ability to defer taxes.

Of course, taxes are only one of many factors that go into the asset location decision. Others include behavioral constraints, access to credit facilities, age, time horizon, and investment availability. Another factor is planned holding period. If the investor has two accounts—a tax deferred account and a taxable account—that contain funds intended for retirement, then they would both have long term objectives and locating

¹⁷ See Dammon, Spatt, and Zhang (2004).

assets based on their taxation makes sense. However, if the tax deferred account contains retirement funds and the taxable account contains funds held for short term needs, it may not be appropriate to locate assets based strictly on their taxation. The asset allocation should be appropriate to the client's time horizon for each account.

6.2 Trading Behavior

The tax burden for many asset classes, such as equities when held in taxable accounts, depends on an investor's trading behavior or that of the mutual fund held by an investor. Consider four types of equity investors. The first type is a *trader* who trades frequently and recognizes all portfolio returns in the form of annually taxed short term gains. This equity management style may subject investment returns to tax burdens similar to those applied to interest income thereby eroding possible tax efficiencies associated with equities. An *active investor*, who trades less frequently so that gains are longer term in nature, may receive more favorable tax treatment.¹⁸ The *passive investor* passively buys and holds stock. The *exempt investor* not only buys and holds stocks, but he never pays capital gains tax.¹⁹ Optimal asset allocation and asset location for each of these investors is likely to differ.

For example, suppose these four individuals invest €1,000 in non-dividend paying stocks that earn 8 percent annually for 20 years. They live in a country that taxes capital gains realized within a year at 40 percent and gains realized after at least one year at 20 percent. The after-tax accumulations and accrual equivalent tax rates are listed in Exhibit 9.

Exhibit 9 Future Accumulations for Different Types of Investors

Investor Type	Future Accumulation (€)	Expression (€)	Accrual Equivalent Return (%)	Accrual Equivalent Tax Rate (%)
Trader	2,554	$1,000[1 + 0.08(1 - 0.4)]^{20}$	4.8	40.0
Active Investor	3,458	$1,000[1 + 0.08(1 - 0.2)]^{20}$	6.4	20.0
Passive Investor	3,929	$1,000[(1.08)^{20}(1 - 0.2) + 0.2]$	7.1	11.5
Exempt Investor	4,661	$1,000(1.08)^{20}$	8.0	0.0

Holding all else constant, the trader accumulates the least amount of wealth, and the tax exempt investor accumulates the most. The active and passive investors fall in between. This comparison illustrates that trading behavior affects the tax burden on stocks (and other assets that provide capital gain appreciation) when held in taxable accounts.

Research suggests that active managers must earn greater pretax alphas than passive managers to offset the tax drag of active trading.²⁰ Other research suggests that mutual fund rankings change significantly depending on whether performance is measured on a pretax or after-tax basis.²¹ Therefore, it is important for the taxable investor to consider the impact of taxes on after-tax returns. Generally, for assets held in taxable accounts, portfolio turnover generates taxable gains that might otherwise

¹⁸ Examples include Australia, Belgium, Denmark, Germany, Japan, Latvia, Luxemburg, the United Kingdom, and the United States.

¹⁹ Some jurisdictions permit capital gains tax to be avoided by making charitable contributions or passing assets to an estate upon death.

²⁰ See, for example, Jeffrey and Arnott (1993).

²¹ See, for example, Dickson and Shoven (1993).

be deferred. Because a number of countries have lower long-term capital gains tax rates for investment held beyond a particular holding period, higher portfolio turnover also foregoes preferential tax treatment associated with longer holding periods and lower turnover.

It is important to note that although locating highly taxed assets in tax sheltered accounts can add value for investors, a proper investment management strategy remains more important than the proper asset location strategy. That is, optimally locating assets in TDAs and taxable accounts cannot overcome the negative impact of a poor investment strategy that either produces a negative pretax alpha or is highly tax inefficient.²²

6.3 Tax Loss Harvesting

Although the previous section indicates that active management can create a tax drag, not all trading is necessarily tax inefficient. While jurisdictions allow realized capital losses to offset realized capital gains, limitations are often placed on the amount of net losses that can be recognized or the type of income it can offset (e.g., short-term capital gains, long-term capital gains, or ordinary income). Canada, for example, only allows tax deductible losses up to the level of realized taxable gains. Realized losses in excess of realized gains may be used to offset gains realized within the last three years. Realized losses beyond that point can be carried forward and applied against gain realized at some future date.

Regardless of the specific tax rules the opportunity to recognize a loss that offsets some kind of taxable gain in a given tax year can create value. The practice of realizing a loss to offset a gain or income—and thereby reducing the current year's tax obligation—is called tax loss harvesting.

EXAMPLE 12

Tax Loss Harvesting: Current Tax Savings

Eduardo Cappellino has a €1,000,000 portfolio held in a taxable account. The end of the 2008 tax year is approaching and Cappellino has recognized €100,000 worth of capital gains. His portfolio has securities that have experienced €60,000 of losses. These securities have not yet been sold and their losses are therefore unrecognized. Cappellino could sell these securities and replace them with similar securities expected to earn identical returns.²³ The federal government taxes capital gains at 20 percent.

- 1 Without making any further transactions, how much tax does Cappellino owe this year?
- 2 How much tax will Cappellino owe this year if he sells the securities with the €60,000 loss?
- 3 How much tax will Cappellino save this year if he sells the securities with the €60,000 loss?

Solution to 1:

Capital gain tax = $0.20 \times €100,000 = €20,000$.

²² See Reichenstein (2001).

²³ Realizing losses by selling and buying similar securities may be subject to certain restrictions by the government or taxing authority.

Solution to 2:

If Cappellino realizes €60,000 of losses, the net gain will be reduced to €40,000.
 New capital gain tax = $0.20 \times (\text{€}100,000 - \text{€}60,000) = \text{€}8,000$.

Solution to 3:

Tax Savings = $\text{€}20,000 - \text{€}8,000 = \text{€}12,000$.

It is important to understand that the tax savings realized in a given tax year from tax loss harvesting overstates the true gain. Selling a security at a loss and reinvesting the proceeds in a similar security effectively resets the cost basis to the lower market value, potentially increasing future tax liabilities. In other words, taxes saved now may be simply postponed. The value of tax loss harvesting is largely in deferring the payment of tax liabilities.²⁴

EXAMPLE 13**Tax Loss Harvesting: Tax Deferral**

In the previous example, the securities with an unrealized loss have a current market value of €110,000 and cost basis of €170,000 (an unrealized loss of €60,000). Cappellino could:

- Option A Hold the securities with the unrealized loss, or
- Option B Sell the securities in 2008 and replace them with securities offering the same return.

Next tax year (2009), the securities increase in value to €200,000 and the securities are sold regardless of which option Cappellino chooses.

- 1 Calculate Cappellino's 2009 tax liability if he holds the securities until year end 2009.
- 2 Calculate Cappellino's 2009 tax liability if he recognizes the loss today in 2008, replaces them with securities offering the same return, and realizes the capital gain at year end 2009.
- 3 Compare the total two-year tax liability under both options using the 2008 tax liability computed in Example 12, in which the 2008 tax liability was €20,000 if the loss was not realized and €8,000 if the loss was realized.

Solution to 1:

Capital gain tax = $0.20(\text{€}200,000 - \text{€}170,000) = \text{€}6,000$.

Solution to 2:

If Cappellino recognizes the loss in 2008 and replaces the securities, the basis will be reset to €110,000 from €170,000.

Capital gain tax in 2009 = $0.20(\text{€}200,000 - \text{€}110,000) = \text{€}18,000$.

²⁴ In cases where securities receive a step up in basis upon inheritance or are gifted to charity, the government will never recapture the current year tax savings, greatly increasing the harvesting value to the investor. Furthermore, in the United States the value of a built-in capital loss is lost at death. For example, someone could realize a \$1,000 loss before death and save taxes. But the asset sold immediately after his death would not benefit from this tax loss.

Solution to 3:

The two-year tax liability for both options is the same:

	2008 (€)	2009 (€)	Total (€)
Option A	20,000	6,000	26,000
Option B	8,000	18,000	26,000

Although the two-year tax liability does not change, an advantage of tax loss harvesting is pushing a portion of the tax liability into subsequent years.

A subtle benefit of tax loss harvesting is that recognizing an already incurred loss for tax purposes increases the amount of net-of-tax money available for investment. Realizing a loss saves taxes in the current year, and this tax savings can be reinvested. This technique increases the amount of capital the investor can put to use.

EXAMPLE 14

Tax Loss Harvesting: Adding Net-of-Tax Principal

In the previous example, suppose Cappellino reinvests the 2008 tax savings if he sells the securities with an unrealized loss of €60,000. His two options are therefore:

- Option A Hold the securities, or
- Option B Sell the securities, and reinvest the proceeds and the tax savings in nearly identical securities.

In 2009, the securities experience an 81.81 percent increase regardless of which option Cappellino chooses.

- 1 Calculate the securities' pretax value next year if he holds the securities.
- 2 Calculate the securities' pretax value next year if he recognizes the loss, and reinvests the proceeds and the tax savings in nearly identical securities.
- 3 What will the after-tax value be under both options if the securities are sold the next year?

Solution to 1:

$$FV = €110,000(1.8181) = €200,000 \text{ (approximately).}$$

Solution to 2:

If Cappellino replaces the securities and invests the tax savings of €12,000, the invested capital will become $€110,000 + €12,000 = €122,000$.

$$FV = €122,000(1.8181) = €221,808.$$

Solution to 3:

The new capital gain tax for Option B at the end of the next tax year is $0.20(€221,808 - €122,000) = €19,962$.

	Pretax (€)	Tax (€)	After-Tax (€)
Option A	200,000	6,000	194,000
Option B	221,808	19,962	201,846

Another advantage of tax loss harvesting is increasing the net-of-tax capital invested in the portfolio.

A concept related to tax loss harvesting is using highest-in, first-out (HIFO) tax lot accounting to sell a portion of a position. When positions are accumulated over time, lots are often purchased at different prices. Depending on the tax system, investors may be allowed to sell the highest cost basis lots first, which defers realizing the tax liability associated with lots having a lower cost basis.

Opportunities to create value through tax loss harvesting and HIFO are greater in jurisdictions with high tax rates on capital gains. Studies have shown that a tax loss harvesting program can yield substantial benefits. Although cumulative tax alphas from tax loss harvesting increase over time, the annual tax alpha is largest in the early years and decreases through time as deferred gains are ultimately realized.²⁵ The complementary strategies of tax loss harvesting and HIFO tax lot accounting have more potential value when securities have relatively high volatility, which creates larger gains and losses with which to work.

The previous section suggests that active trading creates a tax drag on portfolio performance. A certain amount of trading activity is required, however, to harvest tax losses if a portfolio contains unrealized losses. That is, tax-efficient management of stocks in taxable accounts does not require passive management. It requires passively allowing gains to grow unharvested, but actively realizing losses.

Harvesting losses is not always an optimal strategy. For example, in cases where an investor is currently in a relatively low tax rate environment and will face higher tax rates on gains in a subsequent period (either because her tax bracket will increase or because tax rates generally are increasing) the best strategy may be to defer harvesting losses. Doing so would offset gains that will be taxed relatively lightly compared to subsequent gains if tax rates will increase.²⁶ Likewise, one might want to liquidate low basis stock (lowest in, first out or LIFO) if the current tax rate is temporarily low.

6.4 Holding Period Management

The tax regime analysis earlier in the reading indicated that many jurisdictions encourage long-term investing (or equivalently discourage short-term trading) by reducing tax rates on long-term gains. The required holding period varies, of course. Depending on the magnitude of gain from waiting, short-term trading can be difficult to justify on an after-tax basis. If short-term gains are taxed at 40 percent and long-term gains are taxed at 20 percent, then 20 percent (i.e., 40 percent less 20 percent) of an investor's gains are dictated by the holding period.

Exhibit 10 shows the relative benefit of gains subject to a lower tax rate. Using a twelve-month holding period requirement for a long-term capital gain tax of 20 percent versus a short-term capital gain tax of 40 percent, the table assumes that the entire return is taxed each year. For example, consider an 8 percent return over ten years. If returns are completely taxed each year as long term gains at 20 percent, €100 will grow to $€100[1 + 0.08(1 - 0.20)]^{10} = €185.96$. If returns are completely taxed as short-term gains at 40 percent, the accumulation is $€100[1 + 0.08(1 - 0.40)]^{10} =$

²⁵ See, for example, Berkin, Ye, and Arnott (2001), Stein (2004b), and Berkin and Ye (2003).

²⁶ See Stein (2004a) for further discussion.

€159.81. The ratio between the two figures is $€185.96/€159.81 = 1.164$. The benefit of realizing long-term gains in lieu of short-term gains is substantial, especially for long investment horizons and higher returns.

Exhibit 10 Ratio of Future Accumulations: Accumulation Using Long-Term Capital Gains Tax Rate to Accumulation Using Short-Term Capital Gains Tax Rate

r(%)	Investment Horizon in Years (n)							
	5	10	15	20	25	30	35	40
2	1.020	1.040	1.061	1.082	1.104	1.126	1.148	1.171
4	1.040	1.081	1.124	1.168	1.215	1.263	1.313	1.365
6	1.059	1.122	1.189	1.259	1.334	1.413	1.496	1.585
8	1.079	1.164	1.255	1.354	1.461	1.575	1.699	1.833
10	1.098	1.206	1.324	1.453	1.596	1.752	1.924	2.112
12	1.117	1.248	1.394	1.557	1.739	1.943	2.170	2.425
14	1.136	1.290	1.466	1.665	1.892	2.149	2.441	2.773
16	1.155	1.333	1.540	1.778	2.053	2.371	2.738	3.162
18	1.173	1.377	1.615	1.896	2.224	2.610	3.062	3.593

Note: Capital gains are assumed to be taxed each year. Short-term gains are taxed at a rate of 40 percent. Long-term gains are taxed at 20 percent.

The penalty associated with realizing short-term gains in this environment can be viewed from a different perspective. An investment earning a 10 percent pretax return subject to a long term rate yields 8 percent after-tax [i.e., $0.10 \times (1 - 0.20)$]. A 13.33 percent pretax return taxed as a short-term gain is necessary to produce the same result [e.g., $0.08/(1 - 0.40)$]. In other words, the pretax return must be one-third greater to produce the same after-tax result. It can be quite difficult to generate enough pretax alpha to overcome the effect of taxes on short capital gains in these types of tax environments.

Another aspect of holding period management is more tactical in terms of which tax year the tax is due. If a taxpayer subject to taxation on a calendar year basis is contemplating an asset sale in December, it may be wise to defer the sale until January if there is a built-in capital gain or sell the asset in December if there is a built-in loss. Of course the timing of taxation is not the only consideration. The attractiveness of this investment relative to alternative investments must be considered.

EXAMPLE 15

Long-Term Gain

Gretel Hazburger is considering two different portfolio strategies. The first is a hyper-active market-timing trading strategy that is expected to yield a pretax return of 12 percent. All gains will be recognized each year and taxed at the short term capital gain rate of 50 percent. Alternatively, a less active tactical asset

allocation trading strategy is expected to yield a pretax return of 10 percent. All gains will be recognized each year but classified as long term and taxed at 30 percent.

- 1 Which strategy is likely to produce a better after tax return?
- 2 What pretax return is required on the market timing strategy to produce the same after-tax return as the tactical asset allocation strategy?

Solution to 1:

After-tax return to market timing = $0.12(1 - 0.50) = 0.06 = 6$ percent.

After-tax return to tactical asset allocation = $0.10(1 - 0.30) = 0.07 = 7$ percent.

The tactical asset allocation strategy produces a better return.

Solution to 2:

Required return for market timing = $0.07/(1 - 0.50) = 0.14 = 14$ percent.

6.5 After-Tax Mean–Variance Optimization

We have seen how basic principles of measuring asset allocation in a pretax environment do not necessarily apply in a more economically relevant after-tax environment. The same is true for portfolio optimization techniques. That is, pretax efficient frontiers may not be reasonable proxies for after-tax efficient frontiers. It is beyond the scope of this reading to develop specific after-tax mean–variance optimization (MVO) methods. However, an important concept supporting those methods is that the same asset held in different types of accounts is essentially a distinct after-tax asset because it will produce different after-tax accumulations. In other words, an investor optimizing between two different asset classes (e.g., stocks and bonds) across two types of accounts (e.g., taxable and tax deferred accounts) has four different after-tax assets to allocate—stocks or bonds in each of the two accounts.

After recognizing that important insight, an important element in developing an after-tax MVO model is to substitute accrual equivalent returns, like those introduced above, for pretax returns in developing return expectations. Similarly, a portfolio manager would substitute the asset's after-tax standard deviation of returns for pretax standard deviations in the optimization algorithm.

The optimization process must include some constraints. For example, an optimization algorithm cannot allocate more to a tax deferred account than the funds that are available in that account. Specific investment options may also be constrained in some types of accounts. For example, privatized retirement accounts in certain countries may limit investors' options to certain types of securities. In sum, however, standard portfolio optimization practices can be adapted to consider the impact of taxes on investment returns and risk.

SUMMARY

Taxes can have a significant impact on investment returns and wealth accumulation, and managing taxes in an investment portfolio is one way advisers can add value. Taxes come in various forms and each country has its own tax code. Nonetheless, many jurisdictions share some common salient features, and many of those common elements can be identified. This allows one to define regimes that include countries

with similar rules of taxation and to build models that capture the salient features of these regimes. That is the approach taken here and the resulting analysis suggests the following:

- Taxes on investments can take at least three primary forms as discussed here. They can be based on:
 - returns—accrued and paid annually;
 - returns—deferred until capital gains are recognized;
 - wealth—accrued and paid annually.
- The impact of taxes on wealth accumulation compounds over time.
- Deferred taxes on capital gains have less impact on wealth accumulation than annual tax obligations for the same tax rate.
- An investment with a cost basis below its current market value has an embedded tax liability that may reduce future after-tax accumulations.
- Wealth taxes apply to principal rather than returns and in consequence wealth tax rates tend to be much lower than returns-based tax rates.
- Investments are typically subject to multiple forms of taxation. The specific exposure depends on the asset class, portfolio management style, and type of account in which it is held.
- An accrual equivalent after-tax return is the tax-free return that, if accrued annually, produces a given after-tax accumulation.
- An accrual equivalent tax rate is the annually accrued tax rate that, when applied to the pretax return, produces a given after-tax accumulation.
- Sometimes the type of investment account overrides the tax treatment of an investment based on its asset class.
- Tax-deferred accounts allow tax-deductible contributions and/or tax-deferred accumulation of returns, but funds are taxed when withdrawn.
- Tax-exempt accounts do not allow tax-deductible contributions, but allow tax-exempt accumulation of returns even when funds are withdrawn.
- By taxing investment returns, a taxing authority shares investment risk with the taxpayer. As a result, taxes can reduce investment risk.
- The practice of optimally placing particular asset classes in particular types of accounts is called asset location.
- Tax loss harvesting defers tax liabilities from current to subsequent periods and permits more after-tax capital to be invested in current periods.
- When short-term gains are taxed more heavily than long-term gains, it can be difficult for a short-term trading strategy to generate enough alpha to offset the higher taxes associated with short term trading.
- Traditional mean–variance optimization can be modified to accommodate after-tax returns and after-tax risk.
- Otherwise identical assets held in different types of investment accounts should be evaluated as distinct after-tax assets.
- An after-tax portfolio optimization model that optimizes asset allocation also optimizes asset location.

PRACTICE PROBLEMS

The following information relates to Questions 1–7

Alan Jackson has a new client, Aldo Motelli, who expects taxable ordinary income (excluding investments) of €200,000 this tax year. Motelli currently has €250,000 in a taxable investment account for which his main objective is retirement in 15 years. He is considering making the maximum investment of €10,000 in a new type of tax deferred account permitted in his country of residence. The contribution would be deductible and distributions are expected to be taxed at a 20 percent rate when withdrawn. The income tax structure of his country is:

Taxes on Ordinary Income			
Taxable Income (€)		Tax on Column 1 (€)	Percentage on Excess Over Column 1
Over	Up to		
0	20,000	—	10
20,000	40,000	2,000	15
40,000	60,000	5,000	20
60,000	80,000	9,000	25
80,000	100,000	14,000	30
100,000		20,000	35

Taxes on Investment Income

Interest	10% flat rate
Dividends	10% flat rate
Realized capital gains	10% flat rate

- What is Motelli's average tax rate on ordinary income?
 - 22.5%.
 - 27.5%.
 - 35.0%.
- If Motelli's current investment account of €250,000 is invested in an asset which is expected to earn annual interest of 6.5 percent and no capital gains, what is his expected after tax accumulation in 15 years?
 - €578,664.
 - €586,547.
 - €642,960.
- What is the accrual equivalent return assuming the facts in Question 2?
 - 5.85%.
 - 6.50%.
 - 7.22%.

- 4 If Motelli's current investment account of €250,000 is invested in an investment which is expected to earn a return of 7.5 percent, all of which are deferred capital gains, what is his expected after-tax accumulation in 15 years? The account's market value is equal to its cost basis.
- A €640,747.
B €665,747.
C €690,747.
- 5 If Motelli's current investment account of €250,000, has a cost basis of €175,000, and is invested in an investment which is expected to earn a return of 7.5 percent, all of which are deferred capital gains, what is his expected after tax accumulation in 15 years?
- A €673,247.
B €683,247.
C €690,747.
- 6 How much after-tax wealth would Motelli accumulate assuming the same facts as in Question 4 except that 50 percent of all capital gains are recognized each year?
- A €640,747.
B €665,747.
C €678,158.
- 7 Assuming an annual return of 7.5 percent, what would be the after-tax wealth accumulated in 15 years for a single current contribution to the TDA? Assume the contribution would be deductible but taxed at the end of 15 years at a 20 percent tax rate.
- A €23,671.
B €23,965.
C €29,589.

- 8 Sam Nakusi is managing a balanced portfolio of fixed income and equity securities worth £1,000,000. The portfolio's pretax expected return is 6.0 percent. The percentage of return composed of interest, dividends and realized capital gain as well as the associated tax rates are listed below. Assume the portfolio's cost basis equals market value.

Hypothetical Tax Profile and Example		
Tax Profile	Annual Distribution Rate (<i>p</i>)	Tax Rate (<i>T</i>)
Interest (<i>i</i>)	20%	35%
Dividends (<i>d</i>)	30%	15%
Capital gain (<i>cg</i>)	40%	25%

What is the expected future accumulation in 15 years assuming these parameters hold for that time period?

- A £1,930,929.
B £1,962,776.
C £1,994,447.
- 9 In the previous question, recalculate the expected accumulation assuming the portfolio's costs basis is equal to £700,000.

- A £1,373,943.
B £1,962,776.
C £1,887,776.
- 10 Gloria Vander is pursuing a buy-and-hold equity strategy on non-dividend paying stocks. She expects her €400,000 portfolio to experience no turnover over the next 10 years but expects to liquidate it at that time. The cost basis is currently equal to market value. If Vander expects an 8 percent pretax return and capital gains are taxed at 20 percent, what is her accrual equivalent return over that time period?
A 6.40%.
B 6.78%.
C 4.60%.
- 11 What is the accrual equivalent tax rate in the previous question?
A 15.25%.
B 20.00%.
C 84.75%.
- 12 Peter Cavuto lives in a country that imposes a wealth tax of 0.5 percent on financial assets each year. His €500,000 portfolio is expected to return 5 percent per year over the next twenty years. Assuming no other taxes, what is Cavuto's expected wealth at the end of twenty years?
A €1,200,100.
B €1,205,857.
C €1,326,649.
- 13 A client has funds in a tax deferred account and a taxable account. Which of the following assets would be *most appropriate* in a taxable account in a Flat and Heavy Tax Regime, in which dividends and capital gains are taxed at ordinary rates and interest income is tax exempt? Assume that all assets are held in a client's overall portfolio.
A Bonds.
B Actively traded stocks.
C High dividend paying stocks.
- 14 John Kaplan and Anna Forest both have €100,000 each split evenly between a tax deferred account and a taxable account. Kaplan chooses to put stock with an expected return of 7 percent in the tax-deferred account and bonds yielding 4 percent in the taxable account. Forest chooses the reverse, putting stock in the taxable account and bonds in the tax deferred account. When held in taxable account, equity returns will be taxed entirely as deferred capital gains at a 20 percent rate, while interest income is taxed annually at 40 percent. The tax rate applicable to withdrawals from the tax deferred account will be 40 percent. Cost basis is equal to market value on asset held in taxable account.

Kaplan's and Forest's Asset Location			
Tax Profile	Kaplan (€)		Forest (€)
Taxable Account	50,000	bonds	50,000 stock
Tax deferred Account	50,000	stock	50,000 bonds
Total (Before-tax)	100,000		100,000

What is Kaplan's after-tax accumulation after 20 years?

- A €196,438.

B €220,521.

C €230,521.

- 15 In the previous question, what is Forest's after-tax accumulation after 20 years?

A €196,438.

B €220,521.

C €230,521.

- 16 What is the after-tax asset allocation for the following portfolio if withdrawals from the TDA will be taxed at 40 percent?

Account	Pretax Market Value (€)	Asset Class
TDA	200,000	Bonds
Tax-exempt	80,000	Stock
Total	280,000	

A 71.4% bonds; 28.6% stock.

B 50% bonds; 50% stock.

C 60% bonds; 40% stock.

- 17 Lorraine Newman is evaluating whether to save for retirement using a TDA or a tax-exempt account. The TDA permits tax-deductible contributions but withdrawals will be taxed at 30 percent. The tax-exempt account permits tax-free accumulation and withdrawals but contributions are taxable at a 40 percent tax rate. Assuming contribution limits do not affect Newman's choice of accounts, which account should she choose?

A TDA.

B Tax-exempt.

C The choices are the same.

- 18 Which of the following assets would be most appropriate to locate in a tax deferred account in a Heavy Interest Tax Regime assuming all assets are held in a client's overall portfolio?

A Low dividend paying stock.

B Tax exempt bonds.

C Taxable bonds.

- 19 Consider a portfolio that is generally appreciating in value. Active trading is most likely to be *least* attractive in a:

A taxable account.

B tax deferred account.

C tax exempt account.

- 20 Jose DiCenzo has some securities worth €50,000 that have a cost basis of €75,000. If he sells those securities and can use the realized losses to offset other realized gains, how much can DiCenzo reduce his taxes in the *current* tax year assuming capital gains are taxed at 30 percent?

A €7,500.

B €15,000.

C €17,500.

- 21 In the previous question, suppose DiCenzo sells the securities in the current tax year and replaces them with securities having the same returns. He will then sell the new securities in the next tax year. What is the total tax savings assuming DiCenzo does *not* reinvest the tax savings?

- A €0.
 - B €7,500.
 - C €15,000.
- 22 Tax loss harvesting is most effective when:
- A there are few similar investment opportunities for the security with the loss.
 - B the taxpayer is currently in a relatively high tax environment.
 - C the taxpayer is currently in a relatively low tax environment.

SOLUTIONS

- 1 B is correct. Motelli's tax liability on ordinary income is €20,000 (on the first €100,000, third column of table, last row) + (€200,000 – €100,000) × 0.35, or €55,000. The average tax rate on ordinary income is €55,000/€200,000, or 27.5 percent.

- 2 B is correct. The after tax wealth accumulation for annually taxable income is

$$\begin{aligned} FVIF_i &= [1 + r(1 - t_i)]^n \\ FV &= €250,000 \times FVIF_i = €250,000 \times [1 + 0.065(1 - 0.10)]^{15} \\ &= €586,547 \end{aligned}$$

- 3 A is correct. The accrual equivalent return is found by the following equation:

$$\begin{aligned} €250,000(1 + R_{AE})^{15} &= €586,547 \\ R_{AE} &= 5.85\% \end{aligned}$$

- 4 C is correct. The after tax wealth accumulation for deferred capital gains is

$$\begin{aligned} FVIF_{cg} &= (1 + r)^n(1 - t_{cg}) + t_{cg} \\ FVIF_{cg} &= €250,000 \times [(1 + 0.075)^{15}(1 - 0.1) + 0.1] = €690,747 \end{aligned}$$

- 5 B is correct. The after tax wealth accumulation for deferred capital gains is

$$\begin{aligned} FVIF_{cg} &= (1 + r)^n(1 - t_{cg}) + t_{cg} - (1 - B)t_{cg} \\ FVIF_{cg} &= €250,000 \times [(1 + 0.075)^{15}(1 - 0.1) + 0.1 - (1 - 0.70)(0.10)] = \\ &= €683,247 \end{aligned}$$

- 6 C is correct.

$$\begin{aligned} r^* &= r(1 - p_{cg}t_{cg}) \\ &= 0.075(1 - (0.5)(0.10)) = 0.075(1 - 0.05) = 0.07125 \\ T^* &= t_{cg}(1 - p_{cg})/(1 - p_{cg}t_{cg}) \\ &= 0.10[(1 - 0.5)/(1 - 0.5 \times 0.10)] = 0.052632 \\ FVIF_{Taxable} &= (1 + r^*)^n(1 - T^*) + T^* - (1 - B)t_{cg}, B = 1 \\ FV &= €250,000 \times [(1 + 0.07125)^{15}(1 - 0.052632) + 0.052632] \\ &= €678,158 \end{aligned}$$

- 7 A is correct.

$$\begin{aligned} FVIF_{TDA} &= (1 + r)^n(1 - T_n) \\ FVIF &= €10,000[(1 + 0.075)^{15}(1 - 0.20)] = €23,671 \end{aligned}$$

- 8 B is correct.

$$\begin{aligned} r^* &= r(1 - p_d t_d - p_i t_i - p_{cg} t_{cg}) \\ &= 0.06^*[1 - (0.30)(0.15) - (0.20)(0.35) - (0.40)(0.25)] \\ &= 0.0471 \text{ or } 4.71 \text{ percent} \\ T^* &= t_{cg}(1 - p_d - p_i - p_{cg})/(1 - p_d t_d - p_i t_i - p_{cg} t_{cg}) \\ &= t_{cg}(1 - 0.30 - 0.20 - 0.40)/[1 - (0.30)(0.15) - (0.20)(0.35) - \\ &\quad (0.40)(0.25)] \\ &= 0.0318 \\ FVIF_{Taxable} &= £1,000,000[(1 + r^*)^n(1 - T^*) + T^*] \\ &= £1,000,000[(1 + 0.0471)^{15}(1 - 0.0318) + 0.0318] \\ &= £1,962,776 \end{aligned}$$

- 9 C is correct.

$$\begin{aligned} B &= £700,000/£1,000,000 = 0.70 \\ FV_{Taxable} &= £1,000,000[(1 + r^*)(1 - T^*) + T^* - (0.25)(1 - 0.70)] \\ &= £1,000,000[(1 + 0.0471)^{15}(1 - 0.0318) + 0.0318 - 0.075] \\ &= £1,887,776 \end{aligned}$$

- 10 B is correct.

$$\begin{aligned} FV_{cg} &= €400,000[(1 + r)^n(1 - t_{cg}) + t_{cg}] \\ &= €400,000[(1 + 0.08)^{10}(1 - 0.20) + 0.20] \\ &= €770,856 \end{aligned}$$

Solving for the rate set equates €770,856 with its present value of €400,000

$$\begin{aligned} €770,856 &= €400,000(1 + R_{AE})^{10} \\ R_{AE} &= 0.0678 \text{ or } 6.78 \text{ percent} \end{aligned}$$

- 11 A is correct.

$$\begin{aligned} r(1 - T_{AE}) &= R_{AE} \\ 0.08(1 - T_{AE}) &= 0.0678 \\ T_{AE} &= 0.1525 \text{ or } 15.25 \text{ percent} \end{aligned}$$

- 12 A is correct.

$$\begin{aligned} FVIF_w &= [(1 + r)(1 - t_w)]^n \\ FV &= €500,000[(1.05)(1 - 0.005)]^{20} = €1,200,100 \end{aligned}$$

- 13 A is correct. Tax-exempt assets are not appropriate for tax deferred accounts. In a Flat and Heavy Tax Regime, dividends and capital gains are taxed at ordinary rates and are not the best choices for taxable accounts.

- 14 A is correct. The taxable account will accumulate to

$$\begin{aligned} FV_i &= €50,000[1 + r(1 - t_i)]^n \\ &= €50,000[1 + 0.04(1 - 0.4)]^{20} \\ &= €80,347 \end{aligned}$$

The tax deferred account will accumulate

$$\begin{aligned} FV_{TDA} &= €50,000(1 + r)^n(1 - T_n) \\ &= €50,000(1.07)^{20}(1 - 0.40) \\ &= €116,091 \\ \text{Total} &= €196,438 \end{aligned}$$

- 15 C is correct. The taxable account will accumulate to

$$\begin{aligned} FV_{cg} &= €50,000[(1 + r)^n(1 - t_{cg}) + t_{cg}] \\ &= €50,000[(1.07)^{20}(1 - 0.20) + 0.20] \\ &= €164,787 \end{aligned}$$

The tax deferred account will accumulate

$$\begin{aligned} FV_{TDA} &= €50,000(1 + r)^n(1 - T_n) \\ &= €50,000(1.04)^{20}(1 - 0.40) \\ &= €65,734 \\ \text{Total} &= €230,521 \end{aligned}$$

- 16 C is correct. The after-tax value of the TDA account is $€200,000(1 - 0.40) = €120,000$. The after-tax value of the tax-exempt account is $€80,000$. The total after-tax value of the portfolio is $€200,000$. Stock represents $€80,000/€200,000 = 40$ percent of the total, whereas bonds represent $€120,000/€200,000 = 60$ percent of the total.
- 17 A is correct. The future accumulation of the TDA is $(1 + r)^n(1 - 0.30)$, whereas the future accumulation of the tax-exempt account is $(1 + r)^n(1 - 0.40)$. Therefore, the TDA will accumulate more wealth.
- 18 C is correct. In this regime, interest would be taxed heavily and is most appropriate for a tax deferred account.
- 19 A is correct. Active trading would generate annually taxed income and is most appropriate for a tax-exempt account, all else equal. If a portfolio contains unrealized losses, however, a certain amount of trading activity is required to harvest tax losses. That is, tax-efficient management of stocks in taxable accounts does not require passive management. It requires passively allowing gains to grow unharvested, but actively realizing losses.
- 20 A is correct. DiCenzo has a $€75,000 - €50,000 = €25,000$ unrealized loss. Assuming that realizing this loss will decrease his taxable gains by the same amount, his tax bill in the current year will be reduced by $0.30 \times €25,000 = €7,500$.
- 21 A is correct. Assuming DiCenzo does not reinvest the tax savings, tax loss harvesting does not reduce the total tax paid over time. It only defers taxes because recognizing the loss resets the cost basis to a lower figure which will ultimately increase the gain realized late by the same amount. Tax loss harvest can augment return by postponing tax liabilities. Reinvesting the current year's tax savings increases the after-tax principal investment, which can augment the value of tax loss harvesting further.
- 22 B is correct. Tax loss harvesting is best used when tax rates are relatively high.

READING

30

Estate Planning in a Global Context

by Stephen M. Horan, CFA, CIPM, and Thomas R. Robinson, PhD, CFA

Stephen M. Horan, PhD, CFA, CIPM, is at CFA Institute (USA). Thomas R. Robinson, PhD, CFA, is at AACSB International (USA).

LEARNING OUTCOMES

<i>Mastery</i>	<i>The candidate should be able to:</i>
<input type="checkbox"/>	a. discuss the purpose of estate planning and explain the basic concepts of domestic estate planning, including estates, wills, and probate;
<input type="checkbox"/>	b. explain the two principal forms of wealth transfer taxes and discuss effects of important non-tax issues, such as legal system, forced heirship, and marital property regime;
<input type="checkbox"/>	c. determine a family's core capital and excess capital, based on mortality probabilities and Monte Carlo analysis;
<input type="checkbox"/>	d. evaluate the relative after-tax value of lifetime gifts and testamentary bequests;
<input type="checkbox"/>	e. explain the estate planning benefit of making lifetime gifts when gift taxes are paid by the donor, rather than the recipient;
<input type="checkbox"/>	f. evaluate the after-tax benefits of basic estate planning strategies, including generation skipping, spousal exemptions, valuation discounts, and charitable gifts;
<input type="checkbox"/>	g. explain the basic structure of a trust and discuss the differences between revocable and irrevocable trusts;
<input type="checkbox"/>	h. explain how life insurance can be a tax-efficient means of wealth transfer;
<input type="checkbox"/>	i. discuss the two principal systems (source jurisdiction and residence jurisdiction) for establishing a country's tax jurisdiction;

(continued)

LEARNING OUTCOMES

<i>Mastery</i>	<i>The candidate should be able to:</i>
<input type="checkbox"/>	j. discuss the possible income and estate tax consequences of foreign situated assets and foreign-sourced income;
<input type="checkbox"/>	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;
<input type="checkbox"/>	l. discuss how increasing international transparency and information exchange among tax authorities affect international estate planning.

1**INTRODUCTION**

Estate planning is a critical component of wealth management for private clients. Translating the goals of an individual or family into effective legal and tax-efficient solutions can be a challenging task, which requires an intimate knowledge of, among other things, the tax and inheritance laws in a particular jurisdiction. The challenge is often magnified when a client has family members, assets, or income in multiple jurisdictions. Increasingly, high-net-worth individuals (HNWI) and families have these types of international interests.

Identifying the real needs of HNWI is crucial for the portfolio management and estate planning process. The issues are broad and differentiated. For example, non-taxable concerns for HNWI include succession and inheritance planning, business succession, charitable intentions, asset gathering and identification, asset protection and preservation, managing risks of divorce, “living” wills, privacy, second families, special assets like art, “toys,” and more. Depending on the home country, forced heirship, political risk, kidnapping and security, and confidentiality could also be elements to consider in estate planning.

The wealth manager can add value to the advisor–client relationship by understanding salient tax and inheritance planning issues in a client's home country as well as those in other jurisdictions affecting the client's welfare. Professional tax and legal assistance is typically required to conceive, draft, and execute an estate plan or a particular solution within that plan because the field of estate planning falls largely outside the purview of the wealth manager. As such, this reading should not be considered legal advice or interpreted as a substitute for it. It is important, however, for the wealth manager to understand fundamental estate planning principles to identify issues that deserve attention and to integrate the solutions into an overall estate plan. This reading provides a framework for understanding generic tax and non-tax estate planning considerations in both a domestic and cross-border context. It also explores various approaches that different jurisdictions use to structure rules of wealth transfer.

On one hand, the complexity is daunting. On the other hand, a basic understanding of the landscape creates opportunities to develop valuable solutions to common problems. The approach developed here is valuable for several reasons. First, it can be applied in a variety of jurisdictions. The terminology used is intended to be generic and have international interpretation, but the local lexicon may vary from one jurisdiction to the next. Second, it provides an international perspective that advisors can use to counsel clients with a multi-jurisdictional footprint. Third, it provides a framework advisors can use to communicate tax and succession planning considerations to private clients and develop techniques to address the needs and objectives of such

clients. Finally, inheritance laws and tax codes in many jurisdictions are fluid. They change over time as governments use them to affect social and economic objectives. The framework developed in this reading will help the advisor manage those changes and understand their impact should they occur.

DOMESTIC ESTATE PLANNING: SOME BASIC CONCEPTS

2

2.1 Estates, Wills, and Probate

An **estate**¹ is all of the property a person owns or controls. The property in one's estate may consist of financial assets (e.g., bank accounts, stocks, bonds, or business interests), tangible personal assets (e.g., artwork, collectibles, or vehicles), immovable property (e.g., residential real estate or timber rights), and intellectual property (e.g., royalties).

An estate might exclude, however, assets that a settlor transferred to an irrevocable trust during his or her lifetime as a gift, which would be considered an example of a lifetime gratuitous transfer, also known as an *inter vivos* gift. This is discussed in more detail below. It is important to note that the elements of an estate can differ for legal and tax purposes. For example, assets transferred to a trust may no longer be considered to be legally owned by the trust settlor, or the person giving the assets to the trust, whereby the trustee of the trust becomes the legal owner of the trust assets. The assets may be considered the settlor's assets for tax purposes, however, depending on applicable tax law and the trust structure.

Estate planning is the process of preparing for the disposition of one's estate (e.g., the transfer of property) upon death and during one's lifetime. It may involve making arrangements for other personal matters, as well, such as burial arrangements and end-of-life medical instructions should one become incapacitated. It can require the counsel of a variety of professionals including financial, legal, and taxation.

The core document most closely associated with an estate plan is a will or testament. A **will** (or testament) outlines the rights others will have over one's property after death. A testator is the person who authored the will and whose property is disposed of according to the will. **Probate** is the legal process to confirm the validity of the will so that executors, heirs, and other interested parties can rely on its authenticity. A decedent without a valid will or with a will that does not dispose of their property is considered to have died **intestate**. In that case, a court will often decide on the disposition of assets under applicable intestacy laws during the probate process.

Some individuals may wish to avoid probate. Court fees may be sizable, and the process can cause a delay in the transfer of assets to intended beneficiaries. A will can be challenged, and its contents are often a matter of public record, which may concern some wealthy families as it can cause embarrassment or divulge sensitive financial information. Moreover, many problems can arise in probate when multiple jurisdictions are involved. In some instances, probate can be avoided or its impact limited by holding assets in other forms of ownership, such as joint ownership (e.g., joint tenancy with right of survivorship), living trusts, or retirement plans. Through these structures, ownership of property is transferred to beneficiaries without the need for a will and hence the probate process can be avoided or substantially reduced.

¹ Terminology will vary from jurisdiction to jurisdiction depending upon the legal structure of the jurisdiction. The term "estate" comes from common law. Legal structures such as common law are described further.

Property in an estate can be held in a variety of ways including sole ownership, joint ownership, partnership, trust, or through life insurance. Assets held in **sole ownership** are typically considered part of a decedent's estate. The transfer of their ownership is dictated by the decedent's will (or, in the absence of their disposition under the decedent's will, applicable intestacy law) through the probate process. In some jurisdictions, assets held in **joint ownership with right of survivorship** automatically transfer to the surviving joint owner or owners, as the case may be, outside the probate process. The transfer of assets held in trust and the payout of death benefit proceeds under a life insurance policy depend on the terms of the trust deed and the provisions of the life insurance contract, respectively. Trusts, life insurance, and other similar planning techniques can, therefore, transfer assets outside the probate process and can be important estate planning tools.

2.2 Legal Systems, Forced Heirship, and Marital Property Regimes

A country's legal system can affect the disposition of a will. For example, common law jurisdictions, such as the United Kingdom and the United States, generally allow a **testator** (i.e., a person who makes a will) testamentary freedom of disposition by will; that is, the right to use their own judgment regarding the rights others will have over their property after death. Most civil law countries place restrictions on such disposition.

Civil law, which is derived from Roman law, is the world's predominant legal system. In civil law states, judges apply general, abstract rules or concepts to particular cases. **Common law** systems, which usually trace their heritage to Britain, draw abstract rules from specific cases. The distinction is arguably analogous to the distinction between deductive and inductive reasoning. Put differently, in civil systems law is developed primarily through legislative statutes or executive action. In common law systems, law is developed primarily through decisions of the courts.

Countries following **Shari'a**, the law of Islam, have substantial variation, but are more like civil law systems especially in regard to estate planning. In addition to the law of the land, Muslims may wish to consider guidance on inheritance provided by Shari'a or Islamic law. Because Shari'a is often not the law of the land in most countries, including many countries where a majority of the population is Muslim, those who wish to follow Islamic guidance on inheritance are usually able to do so through the making of a will, as long as the contents of the will are not in conflict with the concerned law of the land.

The legal concept of a trust is unique to the common law. A trust is a vehicle through which an individual (called a settlor) entrusts certain assets to a trustee (or trustees) who manages the assets. Civil law countries may not recognize foreign trusts. In fact, twelve of the 22 civil law jurisdictions, including France and Germany, do not recognize trusts at all.

Ownership, like other legal principles in civil law, is a precise concept tempered by statutes that place certain limitations on the free disposition of one's assets. Under **forced heirship rules**, for example, children have the right to a fixed share of a parent's estate. This right may exist whether or not the child is estranged or conceived outside of marriage. Wealthy individuals may attempt to move assets into an offshore trust governed by a different domicile to circumvent forced heirship rules. They may alternatively attempt to reduce a forced heirship claim by gifting or donating assets to others during their lifetime to reduce the value of the final estate upon death. In a number of jurisdictions, however, "clawback" provisions bring such lifetime gifts back

into the estate to calculate the child's share. If the assets remaining in the estate are not sufficient to cover the claim, the child may be able to recover his or her forced share from the donees who received the lifetime gifts.²

Spouses typically have similar guaranteed inheritance rights under civil law forced heirship regimes. In addition, spouses have marital property rights, which depend on the marital property regime that applies to their marriage. For example, under **community property regimes**, each spouse has an indivisible one-half interest in income earned during marriage. Gifts and inheritances received before and after marriage may still be retained as separate property. Upon death of a spouse, the property is divided with ownership of one-half of the community property automatically passing to the surviving spouse. Ownership of the other half is transferred by the will through the probate process.

In **separate property regimes**, prevalent in civil law countries, each spouse is able to own and control property as an individual, which enables each to dispose of property as they wish, subject to a spouse's other rights. Italian forced heirship rules, for example, apply to the decedent's community and separate property. It is noteworthy that, in many civil law countries, couples can elect the marital property regime that will apply to their property.

EXAMPLE 1

Community Property and Forced Heirship

Philippe and Helena Berelli live in a community property regime with their two children. The community property regime entitles a surviving spouse to receive one-half of the community property after the first spouse's death. There are also forced heirship laws in their country that entitle a spouse to one-third of the total estate and the children are entitled to split one-third of the total estate. After their marriage, Philippe received an inheritance that was retained as separate property and is worth €200,000 today. The remainder of the estate is considered community property. Suppose Philippe passes away today with a total estate of €800,000 and wishes to bequeath €300,000 to his surviving mother.

- 1 What is the minimum that Helena should receive?
- 2 What is the minimum amount the children should receive under forced heirship rules?
- 3 May Philippe bequeath €300,000 to his mother?

Solution to 1:

Helena is entitled to the greater of her share under community property or forced heirship rules. Under community property, she is entitled to receive one-half of the community property, or $0.50(€800,000 - €200,000) = €300,000$. Under forced heirship rules she is entitled to one-third of the total estate, or $(1/3)(€800,000) = €266,667$. Therefore, Helena is entitled to €300,000.

Solution to 2:

The children are collectively entitled to receive one-third of the total estate equal to €266,667, or €133,333 for each child.

² See Hayton (2003).

Solution to 3:

Philippe is able to freely dispose of the remainder, which is $€800,000 - €300,000 - €266,667 = €233,333$. Therefore, Philippe is unable to bequeath €300,000 to his mother, but may bequeath the remainder of €233,333.

2.3 Income, Wealth, and Wealth Transfer Taxes

An important part of estate planning is an understanding of how (or whether) assets are taxed when their ownership is transferred at or before death. In general, taxes are levied in one of four general ways:³

- 1 Tax on income
- 2 Tax on spending
- 3 Tax on wealth
- 4 Tax on wealth transfers

Taxes on income can be levied at different rates for a variety of income categories such as compensatory income, investment income, etc. Almost all jurisdictions impose income taxes. Exceptions include the Bahamas, Cayman Islands, and the United Arab Emirates.

Investment income is typically taxed in several possible ways. It can be taxed annually on either an accrual or cash basis as income or gains are received. Alternatively, tax can be deferred until the gain on an asset is ultimately recognized upon the sale or disposition of the asset. Horan and Robinson (2008) review the investment tax regimes of over 50 developed economies and discuss their investment implications in detail.

Taxes on spending normally take the form of sales taxes where a tax is applied to certain types of purchases. These can be applied at the time of purchase or periodically through some computation of consumption.

Wealth-based taxes can come in several forms. A jurisdiction may levy taxes annually on the principal value of real estate, financial assets, tangible assets, etc. Tax based on one's comprehensive wealth is often referred to as **net worth tax** or **net wealth tax**. The economic implications of wealth-based taxes are different from taxes on investment returns because the asset's entire capital base (less liabilities associated with the relevant asset), rather than only incremental gains, is subject to tax. These implications are discussed in greater detail elsewhere.⁴

Taxes on wealth transfers are the purview of estate planning and will be a focus of this reading.⁵ The two primary forms of taxes on wealth transfers correspond to the primary ways of transferring assets: gifting assets during one's lifetime, and bequeathing assets upon one's death through a will or via some other structure.

In an estate planning context, lifetime gifts are sometimes referred to as **lifetime gratuitous transfers**, or *inter vivos* transfers, and are made during the lifetime of the donor. The term "gratuitous" refers to a transfer made with purely donative intent, that is, without expectation of anything in exchange. Gifts may or may not be taxed depending on the jurisdiction. Where gift tax applies, taxation may also depend on

³ This categorization is based primarily on Wilcox, Horvitz, and diBartolomeo (2006) and Horvitz (2008), and corresponds closely with Bronson, Scanlan, and Squires (2007).

⁴ See, for example, Wilcox, Horvitz, and diBartolomeo (2006), Horan and Robinson (2008), Horvitz (2008).

⁵ Wilcox, Horvitz, and diBartolomeo (2006) categorize estate or inheritance taxes as a wealth-based tax, but we and others (including Horvitz 2008) categorize it as a transfer tax because the ownership of inherited assets is transferred to heirs and it is this transaction that is taxed. In addition, an inheritance tax is typically levied once rather than repeatedly as is the case for most wealth-based taxes.

other factors such as the residency or domicile of the donor, the residency or domicile of the recipient, the tax status of the recipient (e.g., nonprofits), the type of asset (moveable versus immovable), and the location of the asset (domestic or foreign).

Bequeathing assets or transferring them in some other way upon one's death is referred to as a **testamentary gratuitous transfer**. The term "testamentary" refers to a transfer made after death. From a recipient's perspective, it is called an inheritance. Similar to lifetime gifts, the taxation of testamentary transfers (transfers at death) may depend upon the residency or domicile of the donor, the residency or domicile of the recipient, the type of asset (moveable versus immovable), and the location of the asset (domestic or foreign).

Taxes on wealth transfer may be applied to the transferor or the recipient. For example, in the case of testamentary gratuitous transfers, some jurisdictions impose an estate tax that is generally on the liability of the transferor (or more precisely, the estate of the transferor). Other jurisdictions impose liability for wealth transfer taxes on the recipient, often referred to as an inheritance tax.⁶ These taxes may be applied at a flat rate or based on a progressive tax rate schedule, where the tax rate increases as the amount of wealth transferred increases. Often the tax is applied after the deduction of a statutory allowance. The tax rate may also depend on the relationship between transferor and recipient. Transfers to spouses, for instance, are often tax exempt.

EXAMPLE 2

UK Inheritance Tax Example

Paul Dasani, an unmarried individual, passed away in November 2008. Dasani was a resident of London at the time of his death and had a total estate valued at £600,000. His children are the beneficiaries of the estate. The United Kingdom imposes an inheritance tax threshold on estates valued above £312,000 in 2008. The tax is payable by the trustee of the estate out of estate assets at a rate of 40 percent on the amount over the statutory allowance of £312,000.

What is the amount of inheritance tax payable?

Solution:

The inheritance tax is computed as:

Estate value	£600,000
Less threshold	(£312,000)
Excess	£288,000
Rate on excess	40%
Inheritance tax	£115,200

EXAMPLE 3

Progressive Estate Tax Example

Ya-wen Chao passed away in a jurisdiction with progressive estate tax rates as provided in the table below. After all applicable exemptions, Chao had a taxable estate of €2,000,000. What is Chao's estate tax?

⁶ As noted earlier, terminology differs from jurisdiction to jurisdiction, and the terms *estate tax* and *inheritance tax* are sometimes used interchangeably.

Taxable Estate (€)	Tax Rate (%)
Up to 600,000	2
600,001–1,500,000	4
1,500,001–3,000,000	7
3,000,001–4,500,000	11
4,500,001–6,000,000	15
6,000,001–10,000,000	20
10,000,001–15,000,000	26
15,000,001–40,000,000	33
40,000,001–100,000,000	41
Over 100,000,000	50

Solution:

The estate tax is computed as:

Tax on first 600,000 (2%) =	€12,000
Tax on next 900,000 (4%) =	36,000
Tax on remaining 500,000 (7%) =	35,000
Total estate tax	€83,000

3

CORE CAPITAL AND EXCESS CAPITAL

Developing an estate plan that will sustain a family and their descendants over multiple generations is a challenging task. A mathematical reality is that the sheer number of family members has a tendency to grow exponentially from one generation to the next as members of subsequent generations propagate, often doubling from one generation to the next.

To put the problem into perspective, consider the case of a 60-year-old couple with no bequest motive; that is, no specific desire to transfer wealth to their children or beyond. One of their likely concerns is how much they can spend from their portfolio without depleting their resources before the end of their lifetimes, which probably means sustaining wealth for at least another 30 years. Estimates vary, but researchers place the sustainable spending rate between 3.5 percent and 6 percent of the initial portfolio value, assuming that spending increases by the inflation rate in subsequent years.⁷ To many, these values are surprisingly modest and illustrate how easily a family can adopt a spending rate that is unsustainable, especially over a time horizon that extends beyond one generation. This challenge of sustaining wealth over multiple generations is magnified as the number of family members grows. Exacerbating the problem further is the potential erosion caused by taxes each time assets are transferred from one generation to the next.

Difficulties also arise when managing the conflicting interests within and across generations. The first generation's wealth transfer goals are often informed by the character, maturity, and circumstances of the individuals involved. In any case, the starting point in developing an estate plan is deciding how much wealth to transfer and

⁷ See, for example, Bengen (1994, 1996, 1997), Guyton (2004), Milevsky and Robinson (2005), Spitzer and Singh (2006), Spitzer, Strieter, and Singh (2007), Stout and Mitchell (2007).

whether to transfer wealth to future generations, philanthropic causes, or elsewhere. The answer to this question begins with an understanding of the spending needs of the first generation.

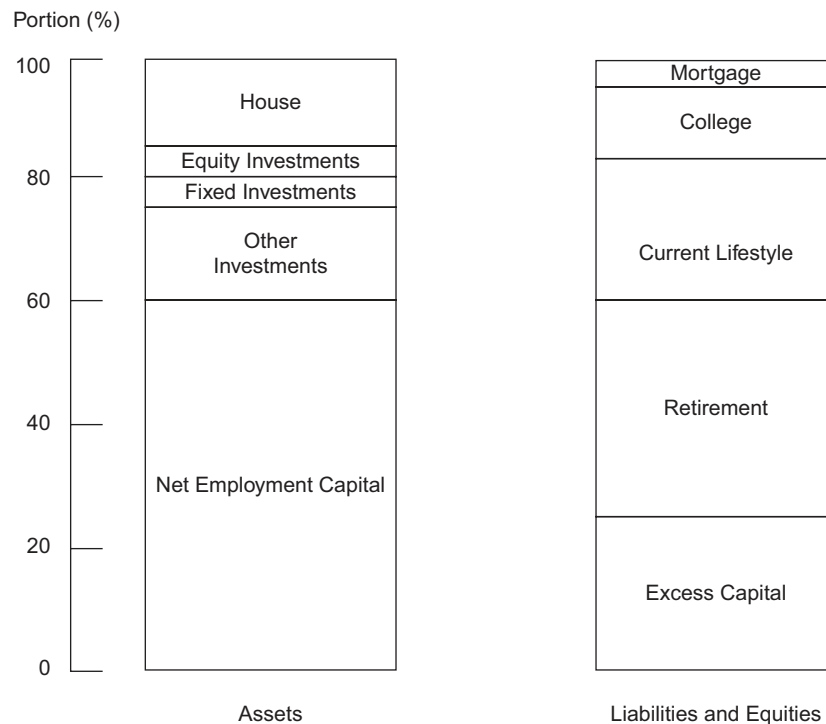
Wilcox, Horvitz, and diBartolomeo (2006) developed the notion of a life balance sheet, which is a comprehensive accounting of an investor's assets and liabilities, both explicit and implied. Explicit assets consist of financial assets (e.g., stocks and bonds), real estate, and other property that can be readily liquidated. A notable implied asset for many is the present value of one's employment capital, often referred to as **human capital** or **net employment capital**. Expected pension benefits are another implied asset that, although non-tradable, provide specific value to the investor.⁸

On the right-hand side of the life balance sheet are an investor's liabilities. Explicit liabilities, such as mortgages or margin loans, are fairly obvious entries. Less obvious are implied liabilities that represent the capitalized value of the investor's desired spending goals. These goals may include providing for a secure retirement, funding children's education, providing a safety reserve for emergencies, or earmarking seed capital for business ventures. The amount of capital required to fund spending to maintain a given lifestyle, fund these goals, and provide adequate reserves for unexpected commitments is called **core capital**.

An investor with more assets than liabilities on the life balance sheet has more capital than is necessary to fund their lifestyle and reserves and therefore has **excess capital** that can be safely transferred to others without jeopardizing the investor's lifestyle.⁹ Exhibit 1 presents a hypothetical life balance sheet with assets listed on the left-hand side. Notice that the capitalized value of the investor's college funding obligations, retirement spending, and safety reserve, is represented by the implied liabilities on the right-hand side of the hypothetical balance sheet.

⁸ Wilcox, Horvitz, and diBartolomeo (2006) and Ibbotson, Milevsky, Chen, and Zhu (2006) discuss human capital and its relation to life cycle planning in more detail.

⁹ Wilcox, Horvitz, and diBartolomeo (2006) refer to this excess capital as "discretionary wealth."

Exhibit 1 Hypothetical Life Balance Sheet

Source: Adapted from Wilcox, Horvitz, and diBartolomeo (2006), p.18.

3.1 Estimating Core Capital with Mortality Tables

The amount of core capital needed to maintain an investor's lifestyle in a probabilistic sense can be estimated in a number of ways. First, it is important to incorporate the effects of inflation, particularly over long time horizons. One can either forecast nominal spending needs discounting them to the present values using nominal discount rates, or forecast real spending needs discounting them using real discount rates. The two approaches are indistinguishable.

The most straightforward way of calculating core capital is to calculate the present value of anticipated spending over one's remaining life expectancy. One problem with this approach is that, by definition, an investor has a significant probability of living past their remaining life expectancy because life expectancy is an average that has substantial variation. Estimates of core capital based on life expectancy will fall short of what is actually required in a great many cases.¹⁰

Another approach is to calculate expected future cash flows by multiplying each future cash flow needed by the probability that such cash flow will be needed, or **survival probability**. When more than one person is relying on core capital (e.g., two

¹⁰ See Wilcox (2008) for a more thorough discussion.

spouses), the probability of survival in a given year is a joint probability that either the husband or the wife survives. Specifically, the probability that either the husband or the wife survives equals:

$$p(\text{Survival}) = p(\text{Husband survives}) + p(\text{Wife survives}) - p(\text{Husband survives}) \times p(\text{Wife survives}) \quad (1)$$

assuming their chances of survival are independent of each other. The present value of the spending need is then equal to:

$$PV(\text{Spending need}) = \sum_{j=1}^N \frac{p(\text{Survival}_j) \times \text{Spending}_j}{(1+r)^j} \quad (2)$$

The numerator is the expected cash flow in year j , that is, the probability of surviving until that year times the spending in that year should the person survive.

For example, consider Ernest and Beatrice Webster, ages 79 and 68, respectively. Their individual probabilities of survival are shown in Columns 3 and 5 of Exhibit 2. Over the next year, Ernest has approximately a 93.6 percent chance of survival, while the younger Beatrice has a 98.3 percent chance of survival.¹¹ The chance of either one of them surviving, however, is greater than either of their individual probabilities of survival. Specifically, the combined probability that either or both survive for the first year is $0.9989 = 0.9355 + 0.9831 - 0.9355 \times 0.9831$. This figure is represented in Column 6.

Exhibit 2 Example of Core Capital Calculation for Ernest and Beatrice Webster

Year (1)	Ernest		Beatrice		Combined $p(\text{Survival})$ (6)	Annual Spending (7)	Expected Spending (8)	Discounted Value (9)
	Age (2)	$p(\text{Survival})$ (3)	Age (4)	$p(\text{Survival})$ (5)				
1	80	0.9355	69	0.9831	0.9989	500,000	499,457	489,664
2	81	0.8702	70	0.9649	0.9954	515,000	512,654	492,747
3	82	0.8038	71	0.9457	0.9893	530,450	524,800	494,531
4	83	0.7339	72	0.9249	0.9800	546,364	535,443	494,666
5	84	0.6686	73	0.9025	0.9677	562,754	544,581	493,244
6	85	0.6001	74	0.8785	0.9514	579,637	551,476	489,695
7	86	0.5327	75	0.8526	0.9311	597,026	555,893	483,938
8	87	0.4674	76	0.8252	0.9069	614,937	557,682	475,976
9	88	0.4048	77	0.7958	0.8785	633,385	556,412	465,580
10	89	0.3459	78	0.7646	0.8460	652,387	551,947	452,789
11	90	0.2912	79	0.7311	0.8094	671,958	543,909	437,446
12	91	0.2414	80	0.6952	0.7688	692,117	532,095	419,553
13	92	0.1968	81	0.6582	0.7254	712,880	517,156	399,778
14	93	0.1576	82	0.6173	0.6776	734,267	497,573	377,098
15	94	0.1239	83	0.5775	0.6298	756,295	476,345	353,931
16	95	0.0955	84	0.5340	0.5785	778,984	450,638	328,265

(continued)

¹¹ It is worth noting that survival probabilities change each year. They are conditioned on one surviving until a particular age. For example, Ernest is currently 79 years old and has an 87.02% chance of surviving two more years until age 81. Moving forward one year, if Ernest survives until age 80, his chances of surviving until age 81 increase because he has already made some progress in that direction. Therefore, the probabilities change from one year to the next and will warrant updating.

Exhibit 2 (Continued)

Year (1)	Ernest		Beatrice		Combined <i>p</i> (Survival) (6)	Annual Spending (7)	Expected Spending (8)	Discounted Value (9)
	Age (2)	<i>p</i> (Survival) (3)	Age (4)	<i>p</i> (Survival) (5)				
17	96	0.0720	85	0.4894	0.5262	802,353	422,165	301,494
18	97	0.0532	86	0.4441	0.4736	826,424	391,431	274,064
19	98	0.0373	87	0.3987	0.4211	851,217	358,456	246,055
20	99	0.0262	88	0.3538	0.3707	876,753	325,053	218,751
21	100	0.0180	89	0.3100	0.3224	903,056	291,161	192,101
22	101	0.0000	90	0.2679	0.2679	930,147	249,204	161,195
23	102	0.0000	91	0.2281	0.2281	958,052	218,569	138,607
24	103	0.0000	92	0.1912	0.1912	986,793	188,652	117,289
25	104	0.0000	93	0.1575	0.1575	1,016,397	160,043	97,551
26	105	0.0000	94	0.1273	0.1273	1,046,889	133,275	79,643
27	106	0.0000	95	0.1009	0.1009	1,078,296	108,795	63,739
28	107	0.0000	96	0.0783	0.0783	1,110,645	86,937	49,935
29	108	0.0000	97	0.0594	0.0594	1,143,964	67,905	38,238
30	109	0.0000	98	0.0439	0.0439	1,178,283	51,764	28,578
31	110	0.0000	99	0.0317	0.0317	1,213,631	38,452	20,812
32	111	0.0000	100	0.0000	0.0000	1,250,040	—	—
<i>Total</i>								9,176,955

The Websters' inflation-adjusted annual spending needs are calculated based on their current spending of €500,000 per year and are increased annually using a 3 percent real growth rate (that is, 3 percent annual spending growth after inflation). The Websters' *expected* spending need each year is presented in the column labeled *Expected Spending* (Column 8). It is calculated as the product of their joint survival probability and their required spending for that year (*Annual Spending*, Column 7). Each year's expected spending is discounted back to the present, using in this case a real risk-free discount rate of 2.0 percent. The sum of each year's present value of expected spending represents the investor's core capital. In this case, Ernest and Beatrice Webster have core capital spending needs of about €9,176,955.¹²

This approach can be modified by conditioning each year's spending based on each spouse's expected survival. For example, if Ernest were to pass away, Beatrice's independent spending needs may be lower than what would have been required if Ernest were also alive. Alternatively, her spending need could be higher. Estimates vary and would certainly be affected by individual circumstances, but some economists estimate that two people can maintain the same living standard for 1.6 times the cost of one. Using this estimate, Beatrice could maintain the same lifestyle with 1/1.6 (or 62.5%) of the amount of spending if Ernest passed away.

In this approach, spending needs are discounted using the real risk-free rate to match the risk of the cash flows. To be sure, the cash flows are not without risk but their uncertainty is most likely unrelated to market risk factors that would be priced in a normal asset pricing model, making their beta equal to zero. One may argue that,

¹² A more conservative approach is assuming that both Ernest and Beatrice survive throughout the forecast horizon provided, rather than assigning probabilities to their combined survival each year.

although mortality risk in this context is non-systematic, it is also non-diversifiable. However, mortality risk can be hedged with traditional life insurance allowing the individual to eliminate the non-systematic risk even if it is non-diversifiable. Therefore, discounting spending needs with the risk-free rate is appropriate.

It is tempting to discount spending needs using the expected return of the assets used to fund them. This would be problematic because the risk of the Websters' spending needs is fundamentally unrelated to the risk of the portfolio used to fund those needs. Merton (2007) draws this distinction in the context of a defined-benefit pension plan. He points out that using the expected return of pension fund assets to discount the liabilities they are intended to fund systematically under-prices those liabilities, and has contributed to the decline of defined-benefit pension plans. Another approach using Monte Carlo simulation with expected returns and volatility is discussed below.

3.1.1 *Safety Reserve*

This approach does not, however, fully account for the risk inherent in capital markets. For example, there is no guarantee that capital markets will produce returns greater than the risk-free rate even over long periods of time. Therefore, the present value of the Websters' spending needs underestimates their true core capital needs. One way to adjust for this underestimation is to augment core capital with a safety reserve designed to incorporate flexibility into the estate plan.¹³ Incorporating flexibility in this way can be important for at least two reasons. First, it provides a capital cushion if capital markets produce a sequence of unusually poor returns that jeopardize the sustainability of the planned spending program. Second, it allows the first generation to increase their spending beyond that explicitly articulated in the spending program. In this way, the safety reserve addresses not only the uncertainty of capital markets, but the uncertainty associated with a family's future commitments.

The size of the safety reserve can be based on a subjective assessment of the circumstances. For example, Evensky (1997) advocates a safety reserve equal to two years of spending. His reasons are behavioral as well as practical. The reserve provides a psychological buffer between an investor and the volatility of capital markets. The investor perceives that their spending needs are unaffected by short-term capital market volatility and is better able to adhere to a particular investment strategy during turbulent markets.

EXAMPLE 4

Core Capital with Mortality Probabilities

Kenroy and Alicia Trudeau live in South Africa and are 64 and 61 years old, respectively. Their survival probabilities based on their current ages are listed in the table below. They would like to maintain annual spending of ZAR 1,000,000 on an inflation-adjusted basis. Inflation is expected to be 3 percent, and the nominal risk-free rate is 5 percent.

¹³ Wilcox (2008) proposes a more complex solution that accounts for the joint distribution of uncertain life spans and asset returns and that produces even more conservative estimates of core capital.

Year	Kenroy		Alicia	
	Age	$p(\text{Survival})$	Age	$p(\text{Survival})$
1	65	0.991	62	0.996
2	66	0.981	63	0.986
3	67	0.971	64	0.976

- 1 What is the probability that either Kenroy or Alicia will survive in each of the next three years?
- 2 What is the capitalized value of their core capital spending needs over the next three years?

Solution to 1:

The probability that either Kenroy or Alicia will survive is equal to the sum of their individual probabilities less the product of their individual probabilities.

$$p(\text{Joint survival}) = p(\text{Kenroy survives}) + p(\text{Alicia survives}) - p(\text{Kenroy survives})p(\text{Alicia survives})$$

For the next three years, the joint probability of survival is:

Year	Joint $p(\text{Survival})$
1	0.9999
2	0.9997
3	0.9993

Solution to 2:

The capitalized value of their core capital spending needs equals the product of the joint probability of survival and the real spending need for each year discounted using the real risk-free rate. Alternatively, one may discount the nominal expected cash flow at the nominal risk-free rate. Using the first approach, the real cash flows will remain constant and be discounted at 2 percent (or 5 percent less 3 percent).¹⁴

Year	Annual Spending	Expected Spending	Discounted Value
1	1,000,000	999,960	980,360
2	1,000,000	999,730	960,910
3	1,000,000	999,300	941,670
			2,882,940

¹⁴ Two percent is an approximation. A more precise calculation is: $(1.05/1.03) - 1 = 1.94\%$.

3.2 Estimating Core Capital with Monte Carlo Analysis

Another approach to estimating core capital uses Monte Carlo analysis, a computer-based simulation technique that allows the analyst to forecast a range of possible outcomes based on, say, 10,000 simulated trials.¹⁵ Rather than discounting future expenses, this approach estimates the size of a portfolio needed to generate sufficient withdrawals to meet expenses, which are assumed to increase with inflation. This approach more fully captures the risk inherent in capital markets than the mortality table approach described above. For example, one could forecast a particular path of portfolio values based on a hypothetical sequence of returns that conforms to the statistical properties associated with the portfolio's expected return. That particular path is one of an infinite set of possible outcomes. The analyst can then forecast another path based on the same set of statistical properties, which will lead to a different outcome. Repeating this procedure thousands of times provides a range of possible outcomes and an understanding of the risk of the portfolio.

One can incorporate recurring spending needs, irregular liquidity needs, taxes, inflation, and other factors into the analysis. In the context of calculating core capital, the wealth manager might estimate the amount of capital required to sustain a pattern of spending over a particular time horizon with, for example, a 95 percent level of confidence. That is, the analyst determines the core capital that sustains spending in at least 95 percent of the simulated trials. A higher level of confidence leads to larger estimates of core capital, and vice versa. The safety reserve may also be added to accommodate flexibility in the first generation's spending patterns. It need not be quite as large as that used in the mortality table method, however, because Monte Carlo analysis already captures the risk of producing a sequence of anomalously poor returns. In contrast to the mortality table method in which cash flows are discounted at the risk-free rate of return, the expected returns used in Monte Carlo analysis are derived from the market expectations of the assets comprising the portfolio.

Milevsky and Robinson (2005) developed a method to calculate sustainable spending rates that approximate those produced from a Monte Carlo simulation but without the need for simulation. Their analysis incorporates life-span uncertainty as well as financial market risk. Exhibit 3 presents an example of ruin probabilities (i.e., the probability of depleting one's financial assets before death) based on their analysis. For example, consider Mr. Harper, a single 65-year-old with the same €500,000 annual spending need as the Websters. He is willing to accept a 9 percent chance that his spending pattern may exhaust his portfolio before the end of his life (e.g., 91 percent level of confidence). This represents the probability of ruin, or the probability that his spending is unsustainable.

This analysis assumes the balanced portfolio has a mean arithmetic return of 5 percent and volatility of 12 percent. It also assumes that the spending rate is determined by the initial portfolio value and increased by the rate of inflation annually thereafter. Under these conditions, Mr. Harper can spend €4.00 for each €100 of core capital, or 4 percent of capital. The core capital required for Mr. Harper to spend €500,000 per year is therefore $€12,500,000 = €500,000/0.04$. If he is willing to accept a higher probability of failure, Mr. Harper will need less capital. For example, a 15.8 percent chance of Mr. Harper's spending outlasting his portfolio allows him to spend €5.00 for every €100, which requires only $€10,000,000$, or $€500,000/0.05$, of core capital.

Asset allocation affects the expected return and volatility of the portfolio, which in turn affects the sustainability of a given spending rate. Obviously, higher return improves sustainability and would require less core capital to generate the same

¹⁵ See Sharpe, Chen, Pinto, and McLeavey (2007) for a more detailed discussion of its applications within the context of a retirement portfolio. In addition, Bernstein (2008) presents Monte Carlo analysis in the larger context of estate planning.

Exhibit 3 Ruin Probability for Balanced Portfolio of 50 Percent Equity and 50 Percent Bonds

Retirement Age	Median Age at Death	Hazard Rate, λ (%)	Real Annual Spending per \$100 of Initial Nest Egg									
			\$2.00 (%)	\$3.00 (%)	\$4.00 (%)	\$5.00 (%)	\$6.00 (%)	\$7.00 (%)	\$8.00 (%)	\$9.00 (%)	\$10.00 (%)	
Endowment	Infinity	0.00	6.7	24.9	49.0	70.0	84.3	92.5	96.6	98.6	99.4	
50	78.1	2.47	1.8	6.4	14.0	24.0	35.2	46.3	56.8	66.0	73.8	
55	83.0	2.48	1.8	6.3	14.0	24.0	35.1	46.2	56.7	65.9	73.7	
60	83.4	2.96	1.5	5.2	11.6	20.1	29.9	40.1	50.0	59.1	67.2	
65	83.9	3.67	1.1	4.0	9.0	15.8	24.0	32.8	41.8	50.5	58.5	
70	84.6	4.75	0.8	2.8	6.3	11.4	17.6	24.7	32.2	39.8	47.2	
75	85.7	6.48	0.5	1.7	3.9	7.2	11.4	16.3	21.9	27.8	33.9	
80	87.4	9.37	0.3	0.9	2.0	3.8	6.2	9.1	12.5	16.3	20.5	

Note: Mean arithmetic portfolio return = 5 percent; standard deviation of return = 12 percent; mean geometric portfolio return = 4.28 percent.

Source: Milevsky and Robinson (2005).

level of spending. Volatility must also be considered, however, because it decreases the sustainability of a spending program for at least two reasons. First, even in the absence of a spending rule, volatility decreases future accumulations. This concept can be illustrated by noting that future accumulations per unit of currency are equal to the product of one plus the geometric average return, or:

$$\begin{aligned} FV &= (1 + R_G)^N = \prod_{n=1}^N (1 + R_n) \\ &= (1 + R_1)(1 + R_2)(1 + R_3) \dots (1 + R_N) \end{aligned} \quad (3)$$

where R_G is the geometric average return over period N . It is commonly referred to as the compounded return. The geometric average return is related to the arithmetic average return and its volatility in the following way:

$$R_G \cong r - \frac{1}{2}\sigma^2 \quad (4)$$

where r is the arithmetic average return and σ is the volatility of the arithmetic return. According to Equation 4, higher volatility decreases the geometric average return and hence future accumulations, which in turn decreases sustainability. Another way to illustrate this point is to consider a €100 portfolio that experiences sequential returns of +50 percent followed by –50 percent. Although the arithmetic average of those returns is zero, the portfolio's value after two years is only €75. The €25 decline in value is due to the volatility of returns represented by the second term in Equation 4.

The second reason volatility decreases sustainability relates to the interaction of periodic withdrawals and return sequences. Equation 3 shows that future accumulations do not depend on the sequence of returns in the absence of periodic spending withdrawals. That is, the future value calculation is unchanged regardless of whether R_1 and R_2 (or any other two periodic returns) are reversed. Put differently, in the example of +50 percent and –50 percent returns, the ending value after two years is the same regardless of whether the portfolio returns are sequenced with the positive return first or last.

This independence disappears when withdrawals are introduced. Specifically, the sustainability of a portfolio is severely compromised when the initial returns are poor because a portion of the portfolio is being liquidated at relatively depressed values, making less capital available for compounding at potentially higher subsequent returns. If the portfolio in our example were to experience a €10 withdrawal at the end of each year, the portfolio would be worth €60 at the end of two years if the positive return occurs first but only €50 if the negative return occurs first. A fixed withdrawal program can be thought of as the opposite of dollar-cost averaging in which volatility has a positive effect on future accumulations, holding the expected return constant.

Several authors have examined the return-volatility trade-off on portfolio sustainability in the context of asset allocation. Diversification is particularly useful in this context because it reduces volatility without necessarily decreasing return. Not surprisingly, recommendations vary; but equity allocations between 30 percent and 75 percent of total portfolio value seem to maximize portfolio sustainability.

EXAMPLE 5

Core Capital with Monte Carlo Analysis

Sophie Zang is a recent widow, 55-years old, living in Singapore. Upon his passing, her husband's estate and life insurance proceeds provided a total of SGD 2,000,000 to maintain her lifestyle. With no children, Zang has no bequest motives but she has established a charitable remainder trust (CRT) upon which

she will rely to maintain her lifestyle in real terms for the rest of her life, with the balance going to her favorite charity upon her death. Assume the trust's asset allocation conforms to the capital market expectations from Exhibit 3.

- 1 How much can Zang withdraw from the CRT if she wants to be at least 98 percent certain that the portfolio will last for the remainder of her life?
- 2 How much can Zang withdraw from the CRT if she is willing to be only 94 percent certain that the portfolio will last for the remainder of her life?

Solution to 1:

The 55-year old retirement age row in Exhibit 3 indicates that Zang's median age at death is approximately 83 years old, or 28 years away. However, she is as likely to live longer than age 83 as she is to die prior to age 83. To be at least 98 percent certain that she does not run out of money, Zang's maximum probability of exhausting her assets should not exceed 2 percent. A spending rate of \$2 per \$100 of assets has a ruin probability of 1.8 percent. So Zang can withdraw approximately $0.02 \times \text{SGD } 2,000,000 = \text{SGD } 40,000$ with 98% certainty that the portfolio will last for the remainder of her life.

Solution to 2:

If Zang can tolerate a 6 percent failure rate, then she can withdraw almost 3 percent from the CRT annually on an inflation-adjusted basis, or $0.03 \times \text{SGD } 2,000,000 = \text{SGD } 60,000$, according to Exhibit 3. A spending rate of SGD 3 per SGD 100 of assets has a ruin probability of 6.3 percent, which is very close to the stated failure rate of 6 percent.

4

TRANSFERRING EXCESS CAPITAL

The first generation's core capital implicitly determines their discretionary wealth, or excess capital, which equals their assets less their core capital. For example, if the Websters have €20,000,000 of capital to meet their spending and discretionary needs and their core capital is €9,200,000, then excess capital is €10,800,000. The challenge then becomes developing a plan to transfer this wealth that matches the Websters' goals (e.g., family, philanthropy), accounts for the tax implications, and provides the desired amount of control and flexibility. As Bronson, Scanlan, and Squires (2007) point out, "The possible legal structures for a wealth transfer are necessarily country specific. Timing of wealth transfers, however, involves the more universal principles of tax avoidance, tax deferral, and maximized compound return."

4.1 Lifetime Gifts and Testamentary Bequests

An obvious method of transferring discretionary wealth is to donate it immediately or during one's lifetime through a series of gratuitous transfers. In jurisdictions having an estate or inheritance tax, gifting has the advantage of lowering the value of the taxable estate, thereby lowering estate or inheritance taxes (except where under applicable law the value of the gift is added back to the estate for estate or inheritance tax purposes). To mitigate this tax minimization strategy, jurisdictions that impose estate or inheritance tax typically also impose gift or donation taxes.

4.1.1 Tax-Free Gifts

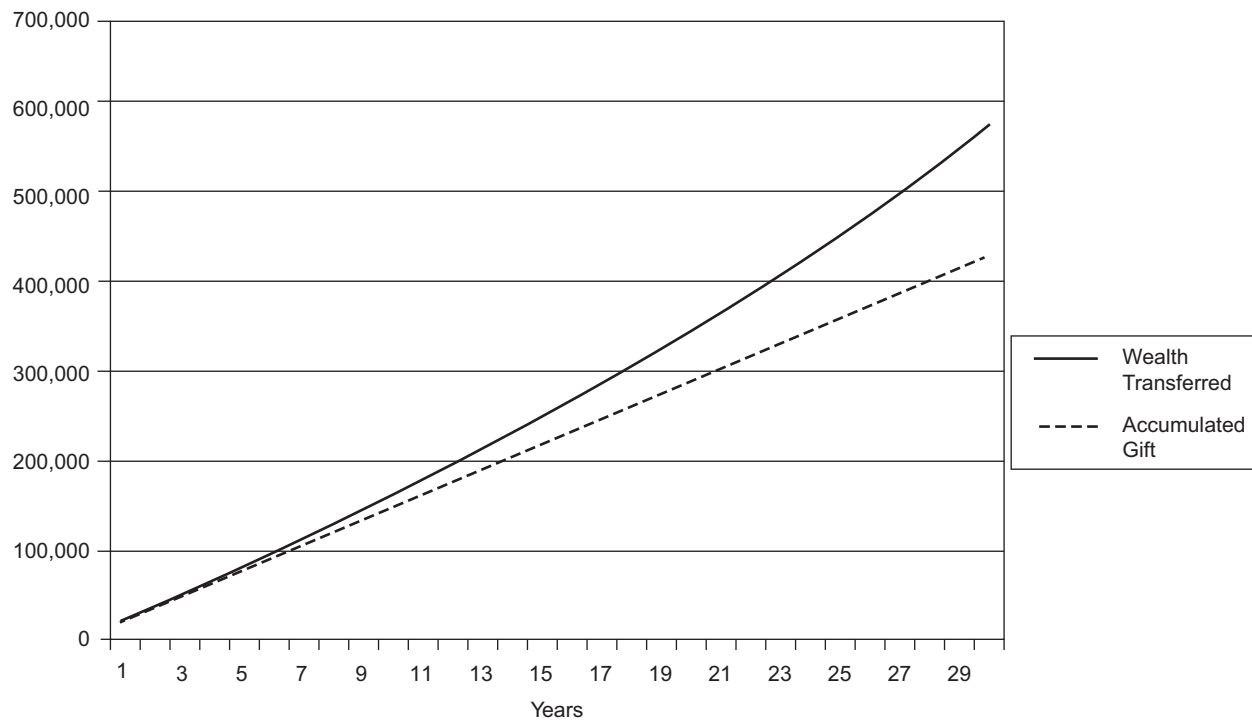
Some gifts can escape transfer tax by falling below periodic or lifetime allowances. South Africa, for example, allows taxpayers to make tax-free gifts of up to ZAR 100,000 per tax year. During their lifetime, UK taxpayers may make gifts up to £312,000 that escape inheritance tax. Germany has gift allowances for gifts to close family members. Each parent may make a €205,000 gift to a child (€410,000 total from both parents) every 10 years, allowing a substantial amount of wealth to be transferred over time.

Other exclusions or relief may apply, as well. In France, for instance, a 50 percent relief applies to gifts from donors less than 70 years old, and a 30 percent relief applies if the donor is between 70 and 80 years old.¹⁶ It is therefore common to be able to transfer some assets by gift in a tax-efficient manner.

Even in jurisdictions with relatively small annual exclusions, a gifting program that is started early and implemented over long periods of time can transfer substantial wealth in a tax-efficient manner. In the United States, for example, a donor's annual gift exclusions are limited to US\$14,000 per year as of 2017, per donee (e.g., a parent may annually transfer US\$14,000 to each child or US\$28,000 from both parents). Exhibit 4 shows that an annual gifting program of transferring US\$14,000 per year tax free at the beginning of each year over a 30-year period transfers almost US\$580,000 inflation-adjusted dollars at a 6 percent nominal return that is taxed at 25 percent annually with a 2.5 percent inflation rate. These assumptions result in a 4.5 percent nominal after-tax rate of return (i.e., $6\% \times [1 - 25\%]$) and a 2 percent real after-tax return (i.e., $4.5\% - 2.5\%$).¹⁷ The dashed line in Exhibit 4 represents the accumulated value of the gifts themselves, excluding investment returns. After 30 years, gifts total $\text{US\$}420,000 = \text{US\$}14,000 \times 30$. If the donor had kept this amount, it would have increased the value in his estate and estate tax liability. Any appreciation of the gifted amounts also escapes estate tax. Assuming a 2 percent real after-tax return would add approximately US\$159,000 of real appreciation (appreciation after adjusting for inflation), for a total value of US\$579,000. A tax-efficient investment strategy that defers the 25 percent tax until the end of the investment horizon increases the accumulated sum to almost US\$666,000. Because these figures are based on real inflation-adjusted returns, this sum represents the amount of capital that can be transferred in today's dollars, and can therefore be a sizable proportion of many estates. Obviously, the amount of real wealth that can be transferred without tax increases with the rate of real return and the time horizon.

¹⁶ LawInContext Private Banking Helpdesk.

¹⁷ Two percent is an approximation. A more precise calculation is $1.045/1.025 - 1 = 1.95\%$.

Exhibit 4 Inflation-Adjusted Wealth Transferred

The benefit of this strategy is that appreciation on gifted assets is effectively transferred to the donee without gift or estate tax. Importantly, appreciation on the gifted asset is likely still subject to tax on investment returns (e.g., dividends and capital gains) whether it remains in the donor's estate or is transferred to a donee. But if the tax-free gift had not been made and had remained in the estate, the appreciation on it would have been subject to estate or inheritance tax.

In general, the relative after-tax value of a tax-free gift made during one's lifetime compared to a bequest that is transferred as part of a taxable estate is

$$RV_{TaxFreeGift} = \frac{FV_{Gift}}{FV_{Bequest}} = \frac{[1 + r_g(1 - t_{ig})]^n}{[1 + r_e(1 - t_{ie})]^n(1 - T_e)} \quad (5)$$

where T_e is the estate tax if the asset is bequeathed at death; r_g and r_e are pretax returns to the gift recipient and the estate making the gift; t_{ig} and t_{ie} are the effective tax rates on investment returns on both the gift recipient and the estate making the gift; and n is the expected time until the donor's death at which point the asset would transfer and be subject to estate tax if it had not been gifted. The numerator is the future after-tax value of the tax-free gift. The denominator is the future after-tax value of a taxable transfer by bequest. The ratio is the relative value of making the tax-free gift compared to the bequest.

If the pretax return and effective tax rates are equal for both the recipient and donor, the relative value of the tax-free gift in Equation 5 simply reduces to $1/(1 - T_e)$. For example, consider the value of a €10,000 bequest in today's value subject to a 40 percent inheritance tax, netting €6,000 after tax. If the wealth is instead transferred as a tax-free gift without having to pay the 40 percent inheritance tax, the relative value of the tax-free gift is 1.67 times [i.e., $1/(1 - 0.40)$] as great as the taxable bequest, or €10,000 versus €6,000.

In the case of annual exclusions or allowances, individuals have the opportunity to transfer wealth without taxes each year. If these allowances or exclusions expire at the end of a tax year and do not accumulate over time, tax-free gifts not made in a particular tax year are lost opportunities to capture this value. It is, therefore, often beneficial for a family with wealth transfer goals to commence an early gifting program, which takes advantage of annual exclusions, where applicable.

4.1.2 Taxable Gifts

Opportunities to add value may even exist when a lifetime gift is taxable. In general, the value of making taxable gifts rather than leaving them in the estate to be taxed as a bequest, can be expressed as ratio of the after-tax future value of the gift and the bequest, or:

$$RV_{TaxableGift} = \frac{FV_{Gift}}{FV_{Bequest}} = \frac{[1 + r_g(1 - t_{ig})]^n (1 - T_g)}{[1 + r_e(1 - t_{ie})]^n (1 - T_e)} \quad (6)$$

where T_g is the tax rate applicable to gifts. It is important to note that this model assumes that the gift tax is paid by the recipient rather than the donor. We consider the alternative below.

If the after-tax returns associated with the gift and the asset to be bequeathed are identical, then the value of a taxable gift reduces to $(1 - T_g)/(1 - T_e)$. If the gift tax rate is less than the estate rate, gifting can still be tax efficient. For example, lifetime gratuitous transfers over £312,000 in the United Kingdom are taxed at 20 percent, while testamentary gratuitous transfers over £312,000 are taxed at 40 percent. The relative value of each pound of lifetime gift compared to each pound of bequest is therefore $1.33 = (1 - 0.20)/(1 - 0.40)$. Australia is another example in which the tax consequence of lifetime gifts can be less than the tax consequence of a testamentary bequest.

Opportunities to create value may even exist when the gift and estate tax rates are equal. As an illustration, in the Netherlands lifetime gifts and bequests are subject to the same progressive tax rate schedule, with tax rates ranging from 5 percent for smaller gifts to 68 percent for larger gifts. Transferring wealth in smaller portions during one's lifetime, rather than transferring wealth in one large transaction when the owner dies, subjects each small transfer to a lower tax rate than one large transfer. Note that some jurisdictions, such as the United States, require a cumulative lifetime gift and estate tax computation that eliminates this benefit.

It is commonly believed that currently gifting assets that are expected to appreciate rather than bequeathing them later is more tax efficient because the future tax liability will be greater at death. If the donee pays the gratuitous transfer tax, however, the present value of the future inheritance tax obligation equals the gift tax. This balance of consideration changes if the donor pays tax, which is discussed in the next section. Similarly, many believe that transferring highly appreciating assets during one's lifetime and bequeathing lower return assets reduces transfer taxes. A valid comparison of the gift versus the bequest, however, requires the risk (and hence return) of the two to be held constant unless the high return asset is somehow valued below its intrinsic value, such as a valuation discount discussed later.

Alternatively, if a wealth manager is able to manage a family portfolio in the aggregate, and considers a family's overall asset allocation without being limited by constraints that dictate which types of assets must be held by which generation, then he or she may be able to place assets tax efficiently. If the return on the transferred assets will be taxed at a lower rate than if the assets were retained in the estate, the aggregate family portfolio can benefit because the numerator in Equation 6 will be greater than the denominator.

For example, consider a Japanese family contemplating a JPY 30 million lifetime gratuitous transfer in 2009. In Japan, JPY 18 million can be transferred free of tax, but the remaining JPY 12 million transfer is subject to a 50 percent tax rate. The same 50 percent rate applies if the gift is delayed and transferred as a bequest, so no tax advantage related to transfer tax rates exists. However, if the recipient of the JPY 12 million gift had a lower marginal tax rate on investment returns (perhaps due to a progressive income tax schedule) of, say, 20 percent compared to the estate's marginal tax rate of, say, 50 percent, the gift can still create a tax advantage. Over a ten year horizon, the advantage for locating an asset with an 8 percent pretax return with the donee rather than the donor would be equal to:

$$RV_{TaxableGift} = \frac{FV_{Gift}}{FV_{Bequest}} = \frac{[1 + 0.08(1 - 0.20)]^{10} (1 - 0.50)}{[1 + 0.08(1 - 0.50)]^{10} (1 - 0.50)} = \frac{0.9298}{0.7401} = 1.256$$

That is, the lower 20 percent tax rate associated with the gift recipient will create 25.6 percent more wealth in 10 years than if the asset had remained in the estate and been taxed at 50 percent annually for 10 years.

Another common strategy for wealth managers managing an aggregate family portfolio is to gift assets with higher expected returns to the second generation or, in general, position assets with higher expected returns in the portfolios of the second generation, leaving the first generation to hold assets with lower expected returns. The additional expected growth of their assets escapes estate tax when the older generation passes on. Of course, assets with higher expected returns generally have higher return volatility, as well, so there is no guarantee that the second generation's portfolio will necessarily experience greater growth. But the strategy may nonetheless produce a better after-tax result on average.

Conceptually, the family portfolio can be balanced whether higher return/risk assets are held in second generation or first generation accounts. The wealth manager may need to make an adjustment, however, to ensure the after-tax risk is comparable between the two options. For example, consider a family with €4,000,000. €3,000,000 is held by the first generation (which is subject to a 40% estate tax) and €1,000,000 is held by the second generation (which will escape estate tax). Suppose further that the second generation holds bonds and the first generation holds equity as illustrated in Panel A of Exhibit 5.

Exhibit 5 Simple Example of After-Tax Asset Allocation

Account Type	Estate Tax Rate (%)	Asset Class	Pretax Market Value	Pretax Weights (%)	After-Tax Market Value	After-Tax Weights (%)
<i>Panel A: Bonds with Second Generation</i>						
First Generation	40	Equity	€3,000,000	75	€1,800,000	64.3
Second Generation	0	Bonds	1,000,000	25	1,000,000	35.7
Total Portfolio			€4,000,000	100	€2,800,000	100
<i>Panel B: Bonds with First Generation</i>						
First Generation	40	Bonds	€1,000,000	25	€600,000	21.4
First Generation	40	Equity	2,000,000	50	1,200,000	42.9
Second Generation	0	Equity	1,000,000	25	1,000,000	35.7
Total Portfolio			€4,000,000	100	€2,800,000	100

Panel C: Bonds with First Generation and Asset Allocation Adjustment

Exhibit 5 (Continued)

Account Type	Estate Tax Rate (%)	Asset Class	Pretax Market Value	Pretax Weights (%)	After-Tax Market Value	After-Tax Weights (%)
First Generation	40	Bonds	€1,666,667	41.7	€1,000,000	35.7
First Generation	40	Equity	1,333,333	33.3	800,000	28.6
Second Generation	0	Equity	1,000,000	25	1,000,000	35.7
Total Portfolio			€4,000,000	100	€2,800,000	100

A traditional view of asset allocation based on pretax values suggests the family has €4,000,000 of assets, 75 percent of which are allocated in stocks and 25 percent of which are allocated in bonds. In after-tax terms, however, the first generation's portfolio has a built-in tax liability of €1,200,000 because it will ultimately be subject to 40 percent tax. Therefore, the family portfolio is really only worth €2,800,000 after estate taxes. Moreover, the after-tax equity allocation is only 64.3 percent rather than 75 percent.¹⁸

Suppose the adviser were to locate equity with a higher expected return in the second generation portfolio so that its greater expected future growth escapes estate tax. The asset allocation may be unaffected based on pretax market values, but the after-tax asset allocation changes. For example, consider placing the €1,000,000 of bonds in the first generation portfolio as in Panel B of Exhibit 5. The pretax asset allocation is still 75 percent equity and 25 percent bonds. However, the after-tax asset equity allocation has increased from 64.3 percent to 78.6 percent because the estate tax decreases the bonds' after-tax value.

To hold the after-tax asset allocation constant, the wealth manager would increase the bond exposure until the after-tax asset allocation returns to its previous level. In this case, the family requires an additional $€400,000 / (1 - 0.40) = €666,667$ of pretax bond exposure.

Long-term after-tax asset allocation is difficult to apply in countries such as France and Germany that regularly modify tax rates, rules, and entities.

4.1.3 Location of the Gift Tax Liability

The preceding discussion implicitly assumes that the tax liability associated with the lifetime gratuitous transfer in the numerator of Equation 6 is borne by the recipient. Examples of jurisdictions that impose gift tax on the recipient include Colombia, Cyprus, Czech Republic, France, Germany, Italy, Japan, Netherlands, Russia, and Spain.

Other jurisdictions, such as Brazil, South Africa, and Switzerland, impose the tax liability on the donor. The distinction can be important for several reasons. First, a cross-border gift could result in both the donor and the recipient being taxed in their respective home countries. Second, if the tax liability is imposed on the donor's taxable estate rather than on the recipient, the tax benefit of the lifetime gift versus the bequest increases. Paying the tax liability from the donor's taxable estate decreases the size of the taxable estate and hence the ultimate estate tax (assuming the recipient's estate will either not be taxed or taxed at a lower rate). Gifting therefore becomes more

¹⁸ Horan and Robinson (2008), Reichenstein (1998, 2001, 2006, 2007), and Horan (2007a,b) develop the concept of after-tax asset allocation in more detail.

attractive from a tax perspective when the gift tax is paid by the donor. The relative after-tax value of the gift when the donor pays the gift tax and when the recipient's estate will not be taxable (using the simplifying assumptions that $r_g = r_e$ and $t_{ig} = t_{ie}$) is:

$$RV_{TaxableGift} = \frac{FV_{Gift}}{FV_{Bequest}} = \frac{[1 + r_g(1 - t_{ig})]^n [1 - T_g + (T_g T_e)]}{[1 + r_e(1 - t_{ie})]^n (1 - T_e)} \quad (7)$$

The last term in the second set of parentheses in the numerator, $T_g T_e$, represents the tax benefit from reducing the value of the taxable estate by the amount of the gift tax. In this way, allowing the gift transfer tax to be deducted from the taxable estate can be viewed as a partial gift tax credit.¹⁹ The size of the partial gift credit equals the size of the gift multiplied by $T_g T_e$.

For example, consider Akio and Haruko Tochigi—a couple wishing to transfer JPY100 million to their child in one year. Assume that the annual pretax returns to the gift recipient and the estate are 3%, the effective tax rate on investment returns is 40% whether the transfer is a gift or a bequest, and the transfer tax is 45%. Using Equation 7 (in JPY million):

$$\begin{aligned} RV_{TaxableGift} &= \frac{FV_{Gift}}{FV_{Bequest}} = \frac{\text{JPY}100[1 + 0.03(1 - 0.40)]^1 [1 - 0.45 + (0.45 \times 0.45)]}{\text{JPY}100[1 + 0.03(1 - 0.40)]^1 (1 - 0.45)} \\ &= \frac{\text{JPY}100(1.018)^1 (0.7525)}{\text{JPY}100(1.018)^1 (0.55)} \\ &= 1.3682 \end{aligned}$$

In other words, the after-tax value of JPY100 million would be almost 37% greater if it were gifted than if it were transferred at the Tochigis' death as a bequest. If the JPY100 million is gifted, it would be reduced to JPY75.25 million, which comprises a JPY55 million after-tax gift plus a JPY20.25 partial gift credit from decreasing the size of the taxable estate. If it were instead transferred as a bequest, it would be reduced to JPY55 million, which comprises a JPY55 million after-tax gift and no partial gift credit. The ratio of JPY75.25 million to JPY55 million would be approximately 1.37, as above. The economic impact of this difference grows as the time between the gift and bequest grows because of the compounding effect.

Exhibit 6 illustrates the after-tax outcomes of the JPY100 million gift in the context of the Tochigis' larger estate. Suppose they have a JPY500 million estate, most of which is taxable. The gift is made just prior to the Tochigis' death or a JPY100 million bequest is made just after their death. The gift reduces the size of the taxable estate to JPY400 million, but the JPY45 million gift tax further reduces the size of the taxable estate from JPY400 million to JPY355 million. Under the gifting strategy, the sum of the after-tax estate and gift is approximately JPY295 million compared to only JPY275 million for the bequest. As a result, the gift strategy saves JPY100 million \times $0.45 \times 0.45 \approx$ JPY20 million in taxes.

Exhibit 6 Illustration of Gift versus Bequest When Donor Pays Transfer Tax

	Gift	Bequest
Gift	100	0
Gift Tax	45	0
Total Disbursement	145	0

¹⁹ Horvitz and Wilcox (2003) demonstrate this in the context of US estate tax law.

Exhibit 6 (Continued)

	Gift	Bequest
Taxable Estate	355	500
Estate Tax	160	225
Net After-Tax Amount	195	275
After-Tax Estate plus Gift	295	275

Note: All amounts are in millions of JPY and rounded to the nearest million.

It should be noted that although the tax rate on gifts and bequests are equal in this example, there is still a tax benefit to the gift by reducing the size of the taxable estate.

In some situations, the primary liability for the transfer tax may lie with the donor, but a secondary liability may rest on the recipient if the donor is unable to pay. The United Kingdom, for example, imposes a gratuitous transfer tax liability on anyone with a vested interest in the gift. In addition to tax considerations, the location of the tax liability has potential implications for a recipient. For example, a recipient may receive an illiquid asset as a gift or bequest. If the recipient is responsible for the tax liability and has limited access to other liquid assets to pay that liability, then the recipient may face unintended liquidity constraints. In extreme cases, taxing authorities may take possession of the asset if the recipient is unable to pay.

EXAMPLE 6

Gift and Estate Taxes

Philippe Zachary is 50 years old and resides in France. He is working with his wealth manager, Pierre Robé, to develop an estate planning strategy to transfer wealth to his second cousin, Etienne. Annual exclusions allow Zachary to make tax-free gifts of €20,000 per year, and gratuitous transfer tax liabilities are the responsibility of the recipient. Zachary notes that the relevant tax rate for bequests from the estate is likely to be 60 percent. He notes further, however, that gifts (in excess of the €20,000 exception mentioned above) made prior to age 70 enjoy 50 percent relief of the normal estate tax of 60 percent, for an effective tax rate of 30 percent. In addition, Etienne enjoys a low tax rate of 20 percent on investment income because he has relatively low income. Zachary, on the other hand, is subject to a 48 percent tax rate on investment income. Zachary is considering gifting assets that are expected to earn a 6 percent real return annually over the next 20 years.

- 1 Considering the first year's tax-free gift associated with the annual exclusion, how much of his estate will Zachary have transferred on an inflation-adjusted basis in 20 years without paying estate tax?
- 2 What is the relative value of the tax-free gift compared to the value of a bequest in 20 years?
- 3 Suppose Zachary wishes to make an additional gift that would be subject to gift tax. What would be the relative after-tax value of that taxable gift compared to a bequest 20 years later?

Solution to 1:

In 20 years, the future value (measured in real terms) equals $€20,000 \times [1 + 0.06(1 - 0.20)]^{20} = €51,080.56$. Note that although the gift was not subject to a wealth transfer tax, its subsequent investment returns are nonetheless taxable at 20 percent.

Solution to 2:

The relative value of the tax-free gift compared to the bequest is

$$\begin{aligned} RV_{TaxFreeGift} &= \frac{FV_{Gift}}{FV_{Bequest}} = \frac{[1 + 0.06(1 - 0.20)]^{20}}{[1 + 0.06(1 - 0.48)]^{20}(1 - 0.60)} \\ &= \frac{2.5540}{0.7395} = 3.45 \end{aligned}$$

The gift is substantially more tax efficient in this case for three reasons. First, the gift is tax free and the bequest is heavily taxed. Second, if Etienne receives the gift, subsequent investment returns will be taxed at a much lower rate than if it is kept inside the estate. Third, the difference has time to compound over a relatively long period of time since the time horizon is 20 years.

Solution to 3:

In this case, the recipient is responsible for paying the gift tax at 30 percent, or half of the 60 percent estate tax. The relative value of the tax-free gift compared to a bequest subject to inheritance tax is:

$$\begin{aligned} RV_{TaxableGift} &= \frac{FV_{Gift}}{FV_{Bequest}} = \frac{[1 + 0.06(1 - 0.20)]^{20}(1 - 0.30)}{[1 + 0.06(1 - 0.48)]^{20}(1 - 0.60)} \\ &= \frac{1.7878}{0.7395} = 2.42 \end{aligned}$$

Although the gift is taxed, the after-tax value of the gift relative to the bequest is still quite large because the gift tax rate is low and because the gift is located in a lightly taxed place (i.e., with Etienne) for a long period of time.

4.2 Generation Skipping

Often, high-net-worth individuals have wealth transfer goals that extend beyond the second generation (i.e., their children). In these cases, transferring assets directly to the third generation (i.e., grandchildren) or beyond may reduce transfer taxes where permitted. In jurisdictions that tax gifts or bequests, transfers from the first generation to the second will be taxed. The same capital may be taxed again if it is transferred from the second to the third generation, and the second generation's estate is taxable. Transferring capital in excess of the second generation's needs for spending, safety, and flexibility, directly to the third generation can avoid a layer of this double taxation.

For example, consider Kenichi and Fumiko Kawaguchi, who have JPY 1,000,000,000 of first generation excess capital they would like to transfer to fulfill their goals of securing a sound financial future for their children and grandchildren. Suppose that core capital for their children amounts to JPY 800,000,000, leaving JPY 200,000,000 of excess capital for the second generation that can be transferred to the third generation. Japan imposes tax rates up to 50 percent on the recipient of a gift or inheritance. Suppose the second generation excess capital of JPY 200,000,000 is transferred

twice—once from the first generation to the second in 10 years, and again from the second to the third generation 25 years beyond that. Its future value at a 5 percent real rate of return (e.g., 8 percent nominal return with 3 percent inflation) will be equal to:

$$\text{JPY } 200,000,000 \times \left[(1.05)^{10} (1 - 0.50) (1.05)^{25} (1 - 0.50) \right] = \text{JPY } 275,800,768$$

If the Kawaguchis instead transfer this sum directly to their grandchildren, the transfer is taxed only once and the future value is

$$\text{JPY } 200,000,000 \times \left[(1.05)^{35} (1 - 0.50) \right] = \text{JPY } 551,601,537$$

or twice as much as when the capital is taxed twice. In general, the relative value of skipping generations to transfer capital that is excess for both the first and second generations is $1/(1 - T_I)$ where T_I is the tax rate of capital transferred from the first to the second generation.

In at least one jurisdiction (e.g., the United States), the taxing authorities discourage this strategy by imposing a special generation skipping transfer tax. This tax, in addition to the usual transfer tax, is imposed on transfers to, among others, grandchildren or subsequent generations and is intended to produce the same overall tax effect had the assets passed sequentially through two generations.

4.3 Spousal Exemptions

Most jurisdictions with estate or inheritance taxes (such as South Africa, the United Kingdom, and the United States) allow decedents to make bequests and gifts to their spouses without transfer tax liability. In these jurisdictions, gratuitous transfer tax exclusions also apply to smaller estates. In the case of the United Kingdom, estates less than £312,000 can pass without inheritance tax. In these situations, it is worthwhile to note that a couple actually has two exclusions available—one for each spouse. As a result, it is often advisable to take advantage of the first exclusion when the first spouse dies by transferring the exclusion amount to someone other than the spouse.

For instance, consider Will and Samantha Quackenbush who have a £700,000 estate. If Will is the first to die and leaves the entire estate tax-free to his wife, Samantha, they have lost an opportunity to transfer £312,000 out of the taxable estate upon Will's death. If the £312,000 was excess capital that would likely be transferred to the next generation anyway, then transferring the £312,000 to the second generation upon Will's death will not trigger additional inheritance tax due to the exclusion and will reduce the taxable value of Samantha's estate to £388,000. In sum, even when assets can be transferred to a surviving spouse without tax consequences, it may be valuable to take advantage of any estate tax exclusions upon the death of the first spouse. Otherwise, the opportunity to use the exclusion to transfer wealth without tax consequences will be lost.

4.4 Valuation Discounts

Gift and estate taxes might also be mitigated by transferring assets that qualify for valuation discounts (or, in appropriate cases, structuring assets to qualify for such discounts). Typically, tax is levied on the fair market value of the asset being transferred, which is a straightforward determination in the case of cash or marketable securities. If shares in a privately held family business are being transferred, establishing fair market value is not obvious and requires a valuation according to some pricing model or models, which, in turn, requires assumptions. In addition to the inputs that must be estimated or forecasted to determine the intrinsic value of an otherwise similar publicly traded company, the valuation of privately held companies is often discounted at a higher cost of capital to reflect the lack of liquidity associated

with their shares. Estimates of the average discount for lack of liquidity range from 20 percent to 25 percent of the value of an otherwise identical publicly traded company. The size of the discount tends to be inversely related to the size of the company and its profit margin.²⁰

If the shares being transferred represent a minority interest in the privately held company, an additional discount is taken for lack of control associated with a minority interest. This valuation is distinct from, but not independent of, an illiquidity discount because positions of control are more marketable than minority positions that lack control. Minority interest discounts can be very large, ranging between 25 percent and 40 percent, but their interaction with illiquidity discounts is not additive. For example, if a stake in a privately held business warrants a 10 percent illiquidity discount and 15 percent lack of control discount, the combined discount may be a lower figure, such as 18 percent, rather than 25 percent.²¹

Transferring assets subject to valuation discount reduces the basis on which transfer tax is calculated, and hence the transfer tax. For this reason, HNWI in some jurisdictions may intentionally create illiquidity and lack of control by placing assets in a family limited partnership (FLP). Rather than gift or bequeath the underlying assets, the first generation transfers minority interests in the FLP, which also is illiquid, to separate individuals. The lack of liquidity and control of an FLP structure may make it eligible for valuation discounts in some jurisdictions. In general, FLPs comprising cash and marketable securities will receive less of a discount than a privately held operating company.

FLPs may have non-tax benefits as well. By pooling the assets of multiple family members together, the family can gain access to certain asset classes requiring minimum investments (e.g., hedge funds, private equity, venture capital), which would be prohibitively large for the individual family members to invest in alone. An FLP also allows participating family members to share in a pro-rata fashion in the gains and losses of family investments. This equitable distribution of gains and losses can be an important consideration in some family dynamics.

4.5 Deemed Dispositions

Rather than impose an estate or inheritance tax on the amount of capital bequeathed at death, some countries treat bequests as **deemed dispositions**, that is, as if the property were sold. The deemed disposition triggers the realization of any previously unrecognized capital gains and liability for associated capital gains tax. The tax is therefore levied not on the principal value of the transfer, but only on the value of unrecognized gains, if any. Australia, Canada, and Colombia are examples of jurisdictions with deemed disposition regimes. Australia and Canada impose no gift taxes, making it potentially advantageous to gift highly appreciated assets that are not likely to be liquidated during one's lifetime anyway.

4.6 Charitable Gratuitous Transfers

Most jurisdictions provide two forms of tax relief for wealth transfers to not-for-profit or charitable organizations. First, most charitable donations are not subject to a gift transfer tax. Second, most jurisdictions permit income tax deductions for charitable donations. Therefore, families with philanthropic aspirations can transfer wealth very tax efficiently.

²⁰ See, for example, Block (2007).

²¹ See Horvitz (2008).

Charitable organizations may also be exempt from paying tax on investment returns, as well. Therefore, the early structuring of assets into a charitable organization allows investment returns to compound tax free, which has a significant impact on wealth accumulation especially over long time horizons. Therefore, the relative after-tax future value over n years of a charitable gift is compared to a taxable bequest as shown in Equation 8 below:

$$\begin{aligned}
 RV_{CharitableGift} &= \frac{FV_{CharitableGift}}{FV_{Bequest}} \\
 &= \frac{(1 + r_g)^n + T_{oi}[1 + r_e(1 - t_{ie})]^n(1 - T_e)}{[1 + r_e(1 - t_{ie})]^n(1 - T_e)}
 \end{aligned}
 \tag{8}$$

The first term in the numerator has no deduction for either gift tax or taxes on investment returns. The second term of the numerator represents the additional value created in the estate associated with the income tax deduction. T_{oi} is the tax rate on ordinary income and represents the current income tax benefit associated with a charitable transfer. The tax advantages of charitable giving allow the donor to either increase the charitable benefit associated with a given transfer of excess capital from the estate, or to use less excess capital to achieve a given charitable benefit.

EXAMPLE 7

Charitable Gifts

Continue with the example of Philippe Zachary in Example 6. France imposes an estate tax at rates of up to 60 percent, but qualifying charitable donations are not subject to inheritance tax. In addition, donations are eligible for income tax deductions at the same income tax rate of 48 percent, which also applies to investment income. What is the relative after-tax value of a charitable donation as compared to a taxable bequest?

Solution:

$$\begin{aligned}
 RV_{CharitableGift} &= \frac{FV_{Gift}}{FV_{Bequest}} \\
 &= \frac{(1.06)^{20} + 0.48[1 + 0.06(1 - 0.48)]^{20}(1 - 0.60)}{[1 + 0.06(1 - 0.48)]^{20}(1 - 0.60)} \\
 &= \frac{3.5621}{0.7395} = 4.82
 \end{aligned}$$

The relative value of the charitable gift is so large because the gift a) escapes estate tax, b) accrues investment returns free of taxes inside the tax-exempt organization, and c) provides Zachary with an income tax deduction.

ESTATE PLANNING TOOLS

5

The gratuitous transfers described above are often implemented through structures that either maximize tax benefit, produce a non-tax benefit, or both. Common estate planning tools include, among others, trusts (a common law concept), foundations (a civil law concept), life insurance, and companies. As noted earlier, partnerships may also

be used in some circumstances. The structure of each has implications for how assets are controlled, whether they are protected from potential claims of future creditors, and how they are taxed. The availability of each of these tools and the tax and tax reporting ramifications to their use depends upon the jurisdiction or jurisdictions of relevance in the given case. Note that while foundations may have originated in civil law jurisdictions, they are also available in some common law jurisdictions. Similarly, trusts are recognized by some civil law jurisdictions.

5.1 Trusts

A trust is an arrangement created by a **settlor (or grantor)** who transfers assets to a trustee. The trust is a relationship in which the trustee holds and manages the assets for the benefit of the beneficiaries. As a result, the beneficiaries are considered to be the beneficial, not legal, owners of the trust assets. The terms of the trust relationship and the principles used by the trustee to manage the assets and distributions to the beneficiaries are outlined in the trust document. It is possible for the settlor of a trust to also be one of the beneficiaries.

Trusts can be categorized in many ways, but two dimensions are particularly important in understanding their character. First, a trust can be either revocable or irrevocable. In a **revocable trust** arrangement, the settlor (who originally transfers assets to fund the trust) retains the right to rescind the trust relationship and regain title to the trust assets. Under these circumstances, the settlor is generally considered to be the owner of the assets for tax purposes in many jurisdictions. As a result, the settlor is responsible for tax payments and reporting on the trust's investment returns. Additionally, the settlor's revocation power makes the trust assets vulnerable to the reach of creditors having claims against the settlor.

Alternatively, where the settlor has no ability to revoke the trust relationship, the trust is characterized as an **irrevocable trust**. In an irrevocable trust structure, the trustee may be responsible for tax payments and reporting in his or her capacity as owner of the trust assets for tax purposes. An irrevocable trust structure generally provides greater asset protection from claims against a settlor than a revocable trust.²² In any event, both a revocable and an irrevocable trust structure can result in the transfer of assets to the beneficiaries without the time, expense, potential challenges, and publicity associated with probate because the settlor transfers legal ownership of the assets to the trustee and the transfer of those assets is dictated by the terms of the trust and not the settlor's will.

Second, trusts can be structured to be either fixed or discretionary. Distributions to beneficiaries of a **fixed trust** are prescribed in the trust document to occur at certain times or in certain amounts. For example, Maria Valez, a first generation wealth owner, may wish to make a large *inter vivos* transfer to her son, Conner, who is too young to manage the assets himself. Valez could fund a trust that directs the trustee to hold the assets until Conner's 21st birthday and begin making annual distributions of a specific amount over 10 years, at which time any remaining assets will be distributed to Conner. The trust is said to be fixed because the terms of the distributions are pre-determined in the trust documentation.

In contrast, if the trust document enabled the trustee to determine whether and how much to distribute based on Conner's general welfare and in the sole and uncontrolled discretion of the trustee, the trust would be called a **discretionary trust**. The settlor can make her wishes known to the trustee through language in the trust document and/or through a non-binding letter of wishes.

²² This is true provided the settlor was neither insolvent nor rendered insolvent when he settled the trust, and any such creditor claims arose after the trust settlement date.

The legal concept of a trust is unique to the common law. Civil law countries may not recognize foreign trusts because it is a legal relationship, not a legal person.

5.1.1 Control

A common motivation for using a trust structure is to make resources available to a beneficiary without yielding complete control of those resources to them. For example, spendthrift trusts can be used to provide resources to beneficiaries who may be unable or unwilling to manage the assets themselves, perhaps because they are young, immature, or disabled. Or perhaps the settlor wishes assets to be used for particular purposes. In any case, the trust relationship can permit a settlor to transfer assets without the expense or publicity associated with probate, yet still retain control of those assets.

5.1.2 Asset Protection

In general, creditors are unable to reach assets that an individual does not own. Just as an irrevocable trust can protect assets from claims against the settlor, as outlined above, discretionary trusts can protect assets from claims against the beneficiaries. Under a discretionary trust, the beneficiaries have no legal right to income generated by the trust or to the assets in the trust itself. Therefore, the creditors of the beneficiaries cannot reach the trust assets.

In the example on the previous page, suppose Maria Valez is concerned that Conner's new wife may divorce him and lay a claim on his trust assets in a divorce settlement. If the trust to which Conner is a beneficiary is discretionary, then his wife would be unable to lay claim to them because it is within the trustee's power to avoid making distributions to Conner. It is important to note that these structures must generally be established in advance of a claim, or even a pending claim, to effectively protect assets.

Trusts may also be used in circumstances where forced heirship laws permit the use of lifetime gifts and trusts to avoid the strict application of forced heirship rule. In fact, many countries specifically prohibit the application of forced heirship rules to trusts, making trusts an especially useful tool in this regard.

5.1.3 Tax Reduction

Trusts can be used to reduce taxes for either the settlor or the beneficiaries. Continuing the illustration above, suppose Valez creates an irrevocable trust such that she is no longer considered the owner of the assets held in the trust for tax purposes. The income generated by the trust assets may be taxed at a lower rate inside the trust than if they were owned by Valez for several possible reasons. In many countries, income is commonly taxed according to a progressive tax schedule (see Horan and Robinson 2008). A progressive tax rate schedule applied to trust income or beneficiary distributions may allow either the trust or beneficiary to apply taxable income to lower tax brackets unavailable to Valez whose income may be taxed at relative high rates.²³ Moreover, if an irrevocable trust is structured as discretionary, a trustee can consider a beneficiary's tax situation to decide whether or not to make a distribution in a particular tax period to the beneficiary. Alternatively, a settlor may create a trust in a jurisdiction with a low tax rate or even no taxes. As is the case with any trust planning technique, this strategy requires a consideration of the tax systems governing the settlor and beneficiary in their home country, which is discussed in more detail in Section 6.2.

²³ In some jurisdictions, however, the progressive rate schedule applicable to trusts may be more compressed than that which applies to individuals. It is therefore important to determine and compare the rate structure that applies to individuals and trusts in the individual case.

The tax laws of some jurisdictions allow tax planning with the use of a trust in which assets are successfully transferred for estate tax purposes, but not for income tax purposes. That is, the assets are no longer part of the settlor's estate, but the income generated from the assets remains taxable to the settlor. In this way, assets can be successfully transferred from a settlor to a beneficiary under a gifting strategy and avoid estate tax. However, the income generated by the assets would nonetheless be taxable to the settlor, thereby further reducing the size of the settlor's taxable estate over time.²⁴ Section 4.1.3 discusses the value of locating the tax liability with the donor. A similar concept applies to the location of the income tax liability on trust asset returns.

5.2 Foundations

A foundation is a legal entity available in some jurisdictions. Foundations are typically set up to hold assets for a particular purpose—such as to promote education or for philanthropy. When set up and funded by an individual or family and managed by its own directors, it is called a private foundation. Similar to trusts, foundations survive the settlor, allow the settlor's wishes to be followed after the settlor's death, and can accomplish the same types of objectives as a trust (control, avoidance of probate, asset protection, and tax minimization). A foundation is based on civil law and, unlike a trust, is a legal person. Often, the choice of a trust or foundation depends on a client's residence or nationality.

5.3 Life Insurance

In creating a trust, a settlor divests himself of assets by transferring them to a trustee for the benefit of beneficiaries, creating potential advantages regarding how the assets are controlled, protected, and taxed. Life insurance is another planning tool in which the policy holder transfers assets (called a **premium**) to an insurer who, in turn, has a contractual obligation to pay death benefit proceeds to the beneficiary named in the policy. As is the case with trusts, insurance can produce tax and estate planning benefits. It can be a useful alternative to a trust in circumstances where the trust relationship is not recognized under applicable law or its legal and tax consequences are uncertain, such as some civil law countries common in Europe and South America that do not recognize trusts.

From a tax perspective, life insurance is afforded beneficial tax treatment in many jurisdictions. Death benefit proceeds paid to life insurance beneficiaries are tax exempt in many jurisdictions and, in some cases, no tax reporting consequences arise. In addition, premiums paid by the policy holder are typically neither part of the policy holder's taxable estate at the time of his or her death, nor subject to a gratuitous transfer tax.²⁵ Therefore, it may be possible to transfer money or other assets through life insurance without tax consequence. Life insurance can also offer income tax advantages in jurisdictions that allow any cash value in the policy to build tax deferred. A life insurance contract can also include provisions that allow a surrender or withdrawal (or partial surrender or withdrawal) of policy value during the policy term, as well as a loan facility, which, in some jurisdictions, can be made with advantageous tax consequences to the policy holder.

²⁴ See Brunel (2002) for a more thorough discussion of these structures.

²⁵ In some jurisdictions the value of the policy may attract gratuitous transfer tax exposure to the policy holder, insured, or beneficiaries; it is therefore important in the individual case to determine the tax consequences of life insurance to the parties.

Tax authorities in many countries recognize these advantages and typically require that life insurance be properly structured to avoid abuse. For example, most jurisdictions require a certain minimum level of risk before a life insurance policy will be treated as such. Other laws mandate that the policy holder must typically have an insurable interest in the life assured to be a valid life insurance contract.

In addition to possible tax benefits, life insurance effectively allows assets to transfer to the policy holder's beneficiaries without the time, expense, potential challenges, and publicity associated with probate. Premiums paid by the policy holder are no longer part of the policy holder's estate at the time of death, and death benefit proceeds under a life insurance contract pass directly to policy beneficiaries outside the probate process. While this is also true of trusts, insurance is recognized in almost every country and generally regarded with less suspicion by tax authorities.

Many wealth owners also use life insurance to help heirs pay inheritance tax triggered by the wealth owner's death. In other words, life insurance is a liquidity planning technique in that it can generate liquidity to pay gratuitous transfer tax. It is, therefore, especially valuable if an inheritance of illiquid assets creates a liquidity crisis for the heir as discussed in Section 4.1.3. In addition, life insurance policies can be used to transfer assets outside forced heirship rules, which normally do not apply to life insurance proceeds.

Life insurance policies can also offer asset protection in their own right or in combination with a trust. Premiums paid for life insurance are generally outside the reach of creditors' claims against the policy holder. Additionally, an insurance policy can assign a discretionary trust as the policy beneficiary. In this way, the use of life insurance in combination with a trust may be useful if the ultimate beneficiaries (i.e., beneficiaries of the trust) are unable to manage the assets themselves (e.g., in the case of minors, disabilities, or spendthrifts).

5.4 Companies and Controlled Foreign Corporations

Companies may also be a useful tool in which to place assets. For example, a **controlled foreign corporation** (CFC) is a company located outside a taxpayer's home country and in which the taxpayer has a controlling interest as defined under the home country law. A possible benefit of placing income generating assets in a CFC is that tax on earnings of the company may be deferred until either the earnings are actually distributed to shareholders or the company is sold or shares otherwise disposed. In addition, a CFC may be established in a jurisdiction that does not tax the company or its shareholders.

Many countries have CFC rules designed to prevent taxpayers from avoiding the taxation of current income by holding assets in a CFC. CFC rules can be triggered if a taxpayer owns more than, say, 50 percent of the foreign company's shares, although the ownership threshold will vary from one jurisdiction to the next. CFC rules may also look beyond direct ownership of CFC shares and consider beneficial ownership in a trust, for example, or even ownership attributed to related parties, such as a taxpayer's family members. Therefore, CFC rules may tax shareholders of a CFC on the company's earnings as if the earnings were distributed to shareholders even though no distribution has been made. This treatment of earnings is called a **deemed distribution**.

6

CROSS-BORDER ESTATE PLANNING

Individuals and families with business and personal interests in more than one country face special estate planning challenges. A family with assets located in multiple jurisdictions may have difficulty passing ownership of those assets upon the wealth owner's death. For example, income generated by assets located outside an investor's home country may be taxed in both the country where the income originates and the home country of the wealth owner. Passing ownership of overseas assets upon death may also be difficult and may trigger multiple tax liabilities from both the home country and country in which the asset is located.

Even when assets are located within a single jurisdiction, passing their ownership to heirs located outside the country through a will, gifting technique, or other strategy can be legally complex and may pose certain tax considerations. This section discusses some of these cross-border estate planning issues.

6.1 The Hague Conference

A legal document created in one country may not necessarily enjoy legal recognition in another country. The **Hague Conference on Private International Law** is an intergovernmental organization that works toward the convergence of private international law.²⁶ Its 69 members consist of countries and regional economic integration organizations, like the European Community (see Exhibit 7). The Conference has developed a series of conventions, or multilateral treaties, that have addressed a variety of international issues, including those related to cross-border transactions. The purpose is to simplify or standardize processes and facilitate international trade. Members of the Conference may or may not ratify a particular convention. Ratification by a country implies a legal obligation to apply the convention within its borders. Non-member countries may participate, as well, by electing to accede to be bound by the treaty, a process that sometimes requires acceptance by states already a party to the convention.

²⁶ More detailed information is available at www.hcch.net.

Exhibit 7 Members of the Hague Conference

Albania	The European	The former	Serbia
Argentina	Community	Yugoslav	Slovakia
Australia	Finland	Republic of	Slovenia
Austria	France	Macedonia	South Africa
Belarus	Georgia	Malaysia	Spain
Belgium	Germany	Malta	Sri Lanka
Bosnia and	Greece	Mexico	Suriname
Herzegovina	Hungary	Monaco	Sweden
Brazil	Iceland	Montenegro	Switzerland
Bulgaria	India	Morocco	Turkey
Canada	Ireland	Netherlands	Ukraine
Chile	Israel	New Zealand	United Kingdom
China	Italy	Norway	of Great
Croatia	Japan	Panama	Britain and
Cyprus	Jordan	Paraguay	Northern
Czech Republic	Republic	Peru	Ireland
Denmark	of Korea	Poland	United States of
Ecuador	Latvia	Portugal	America
Egypt	Lithuania	Romania	Uruguay
Estonia	Luxembourg	Russian	Venezuela
		Federation	

Source: Hague Conference on International Private Law (www.hcch.net).

Because the typical form of a will can vary substantially from one state to the next, their recognition from one jurisdiction to the next can be especially troublesome. The Hague Convention of the Conflict of Laws Relating to the Form of Testamentary Dispositions addresses this particular issue and has been ratified by 39 countries, including most developed nations, but notably excluding the United States. Under this convention, a will is valid in the participating jurisdictions if it is consistent with the internal law associated with:

- the place the will was made;
- the nationality, domicile, or habitual residence of the testator; or
- the location of immovable assets covered under the will.

Some participating countries have exceptions, however. Therefore, separate wills for different jurisdictions may be required, especially in relation to real estate.

An important area in which the Hague Conference affects wealth management is in relation to trusts. Common law jurisdictions recognize trusts, but civil law jurisdictions may not. The Hague Convention of the Law Applicable to Trusts and on Their Recognition is designed to harmonize the recognition of the trust relationship. By ratifying or acceding to this convention, a participating country recognizes the existence and validity of trusts with a written trust instrument as long as they have the following characteristics (outlined in Article 2 of the convention):

- A** The assets constitute a separate fund and are not a part of the trustee's own estate.
- B** Title to the trust assets stands in the name of the trustee or in the name of another person on behalf of the trustee.
- C** The trustee has the power and the duty, in respect of which he is accountable, to manage, employ, or dispose of the assets in accordance with the terms of the trust and the special duties imposed upon him by law.

Twelve countries participate in this convention. Nonetheless, a participating country may view ownership and beneficial interests related to trust relationships in various ways, which may limit some of their advantages. It is important for a wealth manager to know whether a trust will be recognized in the way it is intended by authorities in the countries of relevance to the trust relationship.

6.2 Tax System

Taxable claims for a particular country are based on its jurisdiction claim, that is, the conceptual framework that determines the basis for taxing income or transfers. A country that taxes income sourced within its borders is said to impose **source jurisdiction**, also referred to as a **territorial tax system**.²⁷

Countries may also impose tax based on residency, called **residence jurisdiction**, whereby all income (domestic and foreign sourced) is subject to taxation. Most countries use a residential tax system. The United States is a notable example of a small number of countries that tax their non-resident citizens (in addition to their resident citizens) on worldwide income.

6.2.1 Taxation of Income

Although our primary concern will relate to gratuitous transfer taxes either on or before death for estate planning purposes, the basic concepts relate to income taxes equally well. Persons subject to residence jurisdiction are taxed on their worldwide income. Most countries impose residence jurisdiction on noncitizen residents, but not citizens who are non-resident in the jurisdiction. The United States is a notable exception given that both citizens (regardless of where resident) and residents are subject to US taxation on their worldwide income and estates.

There is no international standardized residency test that applies to individuals. Therefore, residency tests differ between countries. In determining residency, tax authorities may consider subjective standards, such as the extent of an individual's social, familial, and economic ties to the jurisdiction; e.g., whether the individual maintains a dwelling in the country, whether the individual has income producing activities in the country, etc. The tax authorities may also consider objective standards to determine residency, such as the number of days of physical presence the individual has within the country during the relevant tax period. High-net-worth individuals may want to acquire or avoid residency in a particular country, depending on the country's tax burden. It is critical to understand the tax residency rules in the relevant countries to achieve the objectives of such individuals.

For example, UK residents are considered non-domiciled in the United Kingdom if they regard some other country, usually their country of birth, as their permanent home. These resident, non-domiciliaries (RNDs) are taxed only on income sourced in the United Kingdom, as long as they pay the so-called remittance basis charge. Non-UK income is then only subject to UK tax when it is remitted (or deemed remitted) to the United Kingdom. The UK RND tax regime is considered to be a very attractive regime for HNW RNDs when compared to tax regimes imposing tax based on residence. RNDs in the United Kingdom may therefore choose to locate assets outside the United Kingdom in countries having advantageous tax regimes, such as Singapore, and avoid remittances (or deemed remittances) to the United Kingdom.

²⁷ Arnold and McIntyre (2002), p. 21. Much of the discussion in this and the following section is based on this reading.

6.2.2 *Taxation of Wealth and Wealth Transfers*

Like income, wealth and wealth transfers may be subject to tax based on source or residence principles. The source principle taxes wealth economically sourced in a specific country, such as real estate. Jurisdictions that impose a wealth tax beyond that often imposed on real property include Colombia, France, Hungary, India, Mexico, Netherlands, Spain, and Switzerland. The residence principle, should it apply, would tax worldwide wealth with some exceptions, such as real estate situated abroad.

Gifts and bequests may be subject to different tax treatments depending on the tax regime of the donor's country, recipient's country, and the location of the asset being transferred. For example, the source principle would tax assets that are economically sourced or transferred within a particular country, whereas the residence principle would impose transfer tax on all assets transferred by a donor.

Again, the United States is unique in this regard. Not only does the United States impose estate tax on the worldwide assets of its citizens (regardless of where resident) and residents, it also imposes estate tax on non-US individuals holding assets situated in the United States, including US real estate, movable property located in the United States, and security holdings (public or private) of US companies. This may cause some asset transfers to be taxed twice by two different jurisdictions, but many estate tax treaties (discussed below) and, where available, foreign estate tax credits, can eliminate or mitigate this conflict.²⁸ This illustrates, however, that individuals need to be aware of the wealth transfer tax rules of the countries tied to the assets they hold.

6.2.3 *Exit Taxation*

In an effort to mitigate their income, wealth, and estate taxes, HNWIs may sometimes choose to renounce their citizenship in one country and expatriate to another country. To offset the lost tax revenue from such repatriation, some countries impose a so-called "exit tax" on individuals giving up their citizenship or residency. Examples of jurisdictions that impose an exit tax are Australia, Canada, Germany, Israel, Netherlands, Sweden, and the United States. Exit taxation is generally not applicable for capital moving between EU countries, but could apply to capital moving outside the EU. In most cases, the exit tax amounts to a tax on unrealized gains accrued on assets leaving the taxing jurisdiction. This approach is called a deemed disposition. The exit tax may also include an income tax on income earned over a fixed period after expatriation, called a "shadow period."

6.3 Double Taxation

The interaction of country tax systems can result in tax conflicts in which two countries claim to have taxing authority over the same income or assets. This conflict can relate to either income tax or estate/inheritance tax and arise in a number of ways. For example, two countries may claim residence of the same individual, subjecting the individual's worldwide income to taxation by both countries. This situation represents a **residence–residence conflict**.

Alternatively, two countries may claim source jurisdiction of the same asset (i.e., **source–source conflict**). This conflict can arise, for example, on income from a company situated in Country A but managed from Country B. Both countries may claim that the company income is derived from their jurisdiction.

In other situations, an individual in Country A may be subject to residence jurisdiction and, therefore, taxation on worldwide income. Some of the individual's assets may be located in Country B, which exercises source jurisdiction on those assets, creating a **residence–source conflict**. For example, a US citizen owning Singapore

²⁸ See Marcovici (2007).

situated real estate would be subject to US income tax and Singapore income tax on rental income from the property. Residence–source conflicts are the most common source of double taxation and the most difficult to avoid through tax planning without a separate mechanism for relief that can mitigate or eliminate double taxation through either foreign tax credit provisions or double taxation treaties. Because a source country is commonly viewed to have primary jurisdiction to tax income within its borders, the residence country is typically expected to provide double taxation relief if any is provided.

6.3.1 Foreign Tax Credit Provisions

A residence country may choose to unilaterally provide its taxpayers relief from residence–source conflicts within its own tax code using one or more of the following methods: credit method, exemption method, or deduction method.

In the **credit method**, the residence country reduces its taxpayers' domestic tax liability for taxes paid to a foreign country exercising source jurisdiction. The credit is limited to the amount of taxes the taxpayer would pay domestically, which completely eliminates double taxation. Under this method the tax liability equals the greater of the tax liability due in either the residence or source country.

$$T_{CreditMethod} = \text{Max}[T_{Residence}, T_{Source}] \quad (9)$$

For example, suppose a residence country imposes a 50 percent tax on world-wide income but offers a relief for tax paid on foreign-sourced income via the credit method. If the foreign government taxes the foreign-sourced income at 40 percent, the taxpayer will pay a 50 percent tax rate (e.g., $\text{Max}[50 \text{ percent}, 40 \text{ percent}]$). Of the total, 40 percent is paid to foreign authorities and 10 percent is paid to the domestic authorities.

In the **exemption method**, the residence country imposes no tax on foreign-source income by providing taxpayers with an exemption, which, in effect, eliminates the residence–source conflict by having only one jurisdiction impose tax. The tax liability under the exemption method is simply the tax imposed at the foreign source, or:

$$T_{ExemptionMethod} = T_{Source} \quad (10)$$

In the previous example, the tax liability would be 40 percent, all of which is collected by the foreign taxing authority. Only the few jurisdictions using territorial-based tax systems, for example, Singapore and Thailand, have adopted the exemption method.

Under the **deduction method**, the residence country allows taxpayers to reduce their taxable income by the amount of taxes paid to foreign governments in respect of foreign-source income (i.e., provides a tax deduction rather than a credit or exemption). The taxpayer is still responsible for both taxes, but the aggregate liability is less than the sum of the two with the residence country reducing the size of its percentage claim by the product of the two tax rates. The tax rate under the deduction method is therefore equal to:

$$\begin{aligned} T_{DeductionMethod} &= T_{Residence} + T_{Source}(1 - T_{Residence}) \\ &= T_{Residence} + T_{Source} - T_{Residence}T_{Source} \end{aligned} \quad (11)$$

It is clear from this equation that the deduction method results in a higher tax liability than either the credit or exemption method. Using rates from the previous example, the total tax liability equals 70 percent = $0.50 + 0.40 - (0.50 \times 0.40)$. In this case, the source country receives 40 percent and the residence country receives 30 percent [i.e., $0.50 - (0.50 \times 0.40)$]. The residence country makes a partial concession recognizing the primacy of source jurisdiction.

Some jurisdictions provide for foreign tax credit relief in their domestic tax code. The provisions may apply to income, gift, or estate tax. The United States, for example, provides domestic relief for income and estate taxes, but not gift taxes. Therefore, by way of example, a US resident may choose to delay an *inter vivos* wealth transfer of

an asset situated in another country with a gift tax (which would not receive double taxation relief under a double taxation treaty) until the death of the donor at which time it would receive estate tax relief under the United States foreign estate tax credit. France provides foreign tax credit provisions for gift and estate taxes but not for income taxes, whereas Spain provides provisions for all three types of taxes.

It is important to note that the term “foreign tax credit provision” in this context does not imply that the country applies the credit method in providing its relief. It could apply the exemption, deduction method, or some other method. Very few countries, however, have credit provisions based purely on the exemption or credit method.

6.3.2 Double Taxation Treaties

Relief from double taxation may be provided through a double taxation treaty (DTT) rather than domestic tax laws (i.e., foreign tax credit, deduction or exclusion provisions). Tax treaties, of which there are over 2,000 in effect, are intended to facilitate international trade and investment by eliminating double taxation. By limiting source jurisdiction, DTTs resolve residence–source conflicts that are the most frequent cause of double taxation. Virtually all modern tax treaties are based on the OECD (Organisation for Economic Co-operation and Development) Model Treaty.²⁹ The OECD Model Treaty sanctions the exemption and credit method to resolve residence–source conflicts.

With regard to investment income, the OECD Model Treaty endorses the notion that interest income and dividend income have their source in the country of the entity paying the interest or dividend. This type of investment income is taxed through a withholding from the source country. The OECD Model Treaty strongly endorses that withholding tax rates paid to the source country for dividends (paid to other persons) and interest, be limited to 15 percent and 10 percent, respectively; but higher withholding rates are common. Additional tax may be owed to the residence country if the credit or deduction method is used. These relatively low rates are intended to allow tax revenue sharing between the source and residence country.

By contrast, capital gains are taxed in the seller’s country of residence. Gains on immovable property, however, are typically taxed in the source country where the property is located.

In addition to residence–source conflicts, DTTs resolve residence–residence conflicts. A resident is taxable in a particular country “by reason of his domicile, residence, place of management or any other criterion of similar nature.”³⁰ Should these criteria give rise to a “dual resident taxpayer,” the OECD model outlines tie-breakers in the following order based on the location of an individual’s:

- 1 permanent home
- 2 center of vital interests
- 3 habitual dwelling
- 4 citizenship³¹

DTTs typically do not resolve source–source conflicts.

A detailed OECD Commentary aids the interpretation of the OECD Model Treaty. The legal status of OECD Commentary and Model Treaty regarding the interpretation of tax treaties is ambiguous. The Vienna Convention on the Law of Treaties, which governs the interpretation of all treaties (not just tax treaties), states that supplemental means of interpretation can only confirm meaning that is inferred from the treaty

²⁹ See www.oecd.org/dataoecd/52/34/1914467.pdf.

³⁰ Article 4(1) of the OECD Model Treaty.

³¹ Article 4(2) of the OECD Model Treaty.

itself and other agreements between the parties unless these agreements produce an absurd result. In this regard, the OECD commentary provides guidance regarding the interpretation of double tax treaties, but is not binding.

As is the case with double taxation relief under domestic provisions, the nature of the relief under a DTT can be either through the credit, exemption, or deduction method, although the OECD model endorses the credit and exemption methods. Switzerland, for example, usually applies the exemption method in its treaties. It applies the credit method, however, for foreign-source taxes in countries with which it does not have a DTT. Taking another example, France has a DTT covering income, gift, and estate taxes with Sweden. The French treaty with Spain covers only income taxes, but because both countries provide foreign tax credit provisions in their domestic tax codes for gift and estate tax, individuals may nonetheless be able to avoid or mitigate double taxation. Most DTTs relate to income taxes partly because many jurisdictions do not have estate taxes, eliminating the need for an estate DTT. In any case, a taxpayer must qualify as a resident under the terms of the treaty to be eligible for its benefits.

EXAMPLE 8

Double Taxation Credit Provisions

Boris Yankevich is a citizen and resident of Country A and has investments in Country B. The tax rates on investment income and bequests for both countries are listed below. Country A has a residence-based tax system and Country B has a source jurisdiction on income generated within its borders. Country A and Country B have a double tax treaty (DTT) to address this residence–source conflict.

	Country A (%)	Country B (%)
Investment Income Tax	25	40
Estate Tax	50	30

- 1 What is Yankevich's tax rate on investment income under the DTT if it provides for the credit method? How much is remitted to Country A and how much is remitted to Country B?
- 2 What is Yankevich's tax rate on bequests under the DTT if it provides for the exemption method?
- 3 What is Yankevich's tax rate on bequests under the DTT if it provides for the deduction method?

Solution to 1:

Under the credit method, $T_{CreditMethod} = \text{Max}[T_{Residence}, T_{Source}]$. Therefore, $T_{CreditMethod} = \text{Max}[0.25, 0.40] = 40$ percent. In this case, 40 percent is remitted to Country B. Nothing is remitted to Country A because it provides Yankevich with a credit for his entire domestic tax liability.

Solution to 2:

Under the exemption method, the resident country relinquishes the tax jurisdiction, so that the tax rate on bequests would be only 30 percent, all of which is remitted to Country B.

Solution to 3:

Under the deduction method, Yankevich receives a home country tax deduction (rather than a credit) for estate taxes paid to Country B. In this case:

$$\begin{aligned} T_{DeductionMethod} &= T_{Residence} + T_{Source} - T_{Residence}T_{Source} \\ &= 0.50 + 0.30 - (0.50 \times 0.30) = 0.65 \end{aligned}$$

Country A receives 35 percent, and Country B receives 30 percent.

6.4 Transparency and Offshore Banking

A wealth management advisor can often create value for a client or family by developing an estate plan that minimizes taxes. In that regard, it must be emphasized that a distinction exists between tax avoidance (sometimes referred to as “tax minimization”) and tax evasion. **Tax avoidance** is developing strategies that conform to both the spirit and the letter of the tax codes of jurisdictions with taxing authority. **Tax evasion**, on the other hand, is the practice of circumventing tax obligations by illegal means such as misreporting or not reporting relevant information to tax authorities.

International wealth management is occasionally characterized as the practice of placing assets in jurisdictions with bank secrecy laws to avoid detection by taxing authorities in an individual’s home country. Income on these “undeclared funds” would therefore escape taxation by the home country that might otherwise impose a tax obligation if the income were reported. Recent private banking scandals have highlighted this practice. Although such behavior is not appropriate, banking secrecy may provide legitimate benefits in the form of security, privacy, intra-family dynamics, and politics. Moreover, offshore banking centers (such as those in London, New York, Paris, Zurich, Luxembourg, and Singapore) can be an efficient way to provide financial services to clients residing in other countries. So, offshore banking should not be equated with tax evasion.

Information exchange between tax authorities, however, is becoming increasingly fluid and increasingly exposing tax evasion strategies predicated on bank secrecy.³² Marcovici (2007) outlines regulatory and other trends that contribute to this growing trend toward transparency. For example, in an effort to enforce the taxation of worldwide income on its residents and citizens, the United States demanded that banks around the globe provide the names of beneficial owners of all US securities whether the owners were US or non-US citizens. Fearing that the United States could share this ownership information with authorities in the home country of their non-US customers, most banks agreed to become Qualified Intermediaries (QIs). In exchange for not being required to categorically supply the names of beneficial owners of US securities, QIs agree to document this information for all their customers and provide information about US customers upon request. In this way, QIs are able to preserve the confidentiality of their non-US customers but are still required to gather information that could be shared with the US authorities.

Similarly, the European Union Savings Directive (EUSD) is a system to collect tax on interest payments made in one EU country for the benefit of an individual in another EU country. Under the EUSD system, EU members agree to automatically exchange information with each other with the exception of Austria, Belgium, and Luxembourg. These countries apply a tax at the source and transfer the respective proportion of the pooled tax revenues to the EU country of residency of the concerned EU national.

³² See Marcovici (2007) for a more thorough discussion of the regulatory climate on which this section is largely based.

Other trends are also contributing to the increasing rate of information exchange between jurisdictions. In some cases authorities collect information from credit card companies about individuals who use credit cards in their country, whether or not they are citizens of that country. This information can then be shared with the individual's home country. Tax treaties not only provide relief from double taxation, but may also provide for far-reaching exchange of information between countries.

In sum, estate planning strategies designed around an understanding of the economics of taxation and law are likely to provide lasting benefit for wealthy individuals and families. Families that build wealth management plans on a foundation of bank secrecy and of "hiding the money" impose archaic and potentially costly structures on subsequent generations, who will likely be operating in a more transparent and compliant legal and tax environment. Moreover, these structures pass on values that may not match subsequent generations' attitudes toward integrity, compliance, and transparency.

SUMMARY

Estate planning is a multidisciplinary endeavor that involves the intersection of tax, law, and finance. An understanding of the primary legal, tax, and financial issues affecting clients can help wealth managers effectively and strategically create tax-efficient wealth transfer strategies that meet clients' needs and objectives. The major points of this reading include:

- Assets in an estate can have ownership transferred by virtue of the type of ownership (e.g., sole versus joint), a will, or a trust.
- Probate is the process by which a will is validated and can be relied on by interested parties.
- A country's legal system can limit the freedom of a testator to dispose of assets as he or she sees fit (e.g., forced heirship, community property rules, etc.).
- The two primary ways of transferring ownership of assets are lifetime gratuitous transfers (i.e., gifts) and testamentary gratuitous transfers (i.e., bequests).
- A wealth transfer strategy involves estimating an individual's or a family's core capital and excess capital.
- Core capital is the amount of capital required to maintain a given lifestyle and provide adequate reserves for unexpected commitments and can be estimated using mortality tables or Monte Carlo analysis.
- Excess capital represents assets above and beyond core capital that can be safely transferred without jeopardizing the first generation's lifestyle.
- Tax-free gifts that fall below periodic or lifetime allowances can be an effective means of minimizing estate tax, especially if a gifting program is developed early.
- Opportunities for tax-efficient gifting programs also exist when lifetime gifts are taxed, especially when the gift tax is paid by the donor rather than by the recipient.
- Transferring capital in excess of a second generation's need for spending, safety, and flexibility directly to the third generation or beyond (i.e., generation skipping) can help to minimize taxes where permitted.

- Taxpayers in jurisdictions with both spousal exemptions and exclusions for smaller estates in effect have two estate exclusions available—one for each spouse.
- Tax efficiencies are possible using valuation discounts and charitable gratuitous transfer strategies.
- Common estate planning tools include trusts, foundations, insurance, and companies, each of which can provide benefits related to asset control, protection from creditors, and taxation.
- The control and protection trusts offer, whether structured as revocable or irrevocable, can provide flexibility as well as legal validity.
- Families with an international footprint face special issues relating to the drafting and recognition of legal documents, such as wills and trusts.
- The taxing authority of a country is determined by its tax system (e.g., source versus residence) and may conflict with the tax authority of another country.
- Jurisdictional claims based on source or residency can conflict with source jurisdictions typically given primacy.
- Double taxation conflicts can be resolved through either foreign tax credit provisions of the home country or double taxation treaties with other countries.
- The ability of locating undeclared funds in offshore savings accounts and other offshore structures to avoid detection by home country tax authorities is being eroded by trends toward an increase in information exchange and transparency across countries; compliant, tailored, tax-efficient strategies are key to meet the needs and objectives of clients and of their successor generations.

PRACTICE PROBLEMS

- 1 The drawing up of a will is an area of estate planning that requires an individual to have a clear understanding of the tax and succession (or inheritance) laws of any jurisdiction of relevance to the testator. Although an individual may elect to draw up a will, the validity of the will could be subject to various challenges in the probate process. In addition, probate may create sizeable court fees as well as unwelcome publicity and a delay in the distribution of assets. Describe how an individual can attempt to reduce or even avoid the impact of:
 - A probate.
 - B forced heirship.
- 2 After a lengthy career as a metallurgical engineer, Greg Pearsall recently retired at age 70 and is looking forward to spending retirement with his wife Christine, who is 75 years old. Although both Greg and Christine are now retired, they would prefer to maintain their present lifestyle which currently requires annual spending of \$75,000 in real terms. Inflation is expected to be 6 percent, and the nominal risk-free rate is 10 percent. The Pearsalls' survival probabilities for the next five years based on their current age are listed in the table below.

Year	Greg		Christine	
	Age	$p(\text{Survival})$	Age	$p(\text{Survival})$
1	71	0.9660	76	0.8235
2	72	0.9371	77	0.7996
3	73	0.9152	78	0.7727
4	74	0.8883	79	0.7208
5	75	0.8544	80	0.6919

- A What is the probability that either Greg or Christine will survive over each of the next five years?
 - B Is it appropriate to use the expected return of the assets used to fund their spending needs when calculating the capitalized value of the Pearsalls' core capital spending needs? Why or why not?
 - C What is the capitalized value of the Pearsalls' core capital spending needs over the next five years?
- 3 As part of their estate, Tony and Eleanor Hall currently own a \$2.5 million portfolio of equities and bonds that has an average annual pretax return of 10 percent. The Halls' after-tax return on the portfolio is 7 percent (the tax rate is 30 percent). Due to the rapid deterioration in their health, the Halls are considering transferring the \$2.5 million portfolio to their eldest grandchild, Joe, during the current financial year. By transferring their investment portfolio directly to their grandson, the Halls are attempting to reduce the transfer taxation effect of their inheritance. Although \$1.5 million can be transferred tax free, local jurisdiction requires that the remaining \$1 million transfer be subject to a 30 percent tax rate, which is Joe's responsibility as donee. The Halls have consulted with their financial planner as they are uncertain whether the 30 percent tax rate would also apply if their gift to their grandson is delayed and transferred as a bequest five years from today. Their grandson currently pays a marginal tax rate of 25 percent.

- A** Discuss the effectiveness of the Halls' generation skipping strategy.
 - B** Calculate the relative after-tax value of the Hall's \$1 million gift (above and beyond the \$1.5 million exclusion) to their grandson. Assume the \$1 million transfer is subject to 30 percent tax whether it takes place today or is delayed and transferred as a bequest in five years.
 - C** Given that the \$1 million transfer is subject to 30 percent tax whether it takes place today or is delayed and transferred as a bequest in five years, is there any advantage in delaying payment of the gift by five years?
- 4** After five decades of living in Country A, a wealthy entrepreneur, Andrew Lloyd, has recently retired and taken up residency in Country B. Although he now lives in Country B, Lloyd has retained a number of investment properties in Country A. The investment income tax rate is 45 percent and 30 percent in Country A and Country B, respectively.
 - A** Define source and residence tax as two possible primary tax systems of Country A and Country B.
 - B** Discuss three potential double taxation conflicts that could arise due to Lloyd's new residency in Country B.
 - C** Calculate Lloyd's tax rate liability under the following three methods providing for double taxation relief, assuming scenarios where either country claims source or residence jurisdiction:
 - i.** Credit method.
 - ii.** Exemption method.
 - iii.** Deduction method.

SOLUTIONS

- 1 A** There is often a desire to avoid probate as court fees may be sizable, and the process can cause a delay in the transfer of assets to intended beneficiaries. A will can be challenged, and its contents are often a matter of public record, which may concern some wealthy families as it may cause embarrassment or divulge sensitive financial information. Moreover, many problems can arise in probate when multiple jurisdictions are involved. In some instances, probate can be avoided or its impact limited by holding assets in joint ownership (e.g., joint tenancy with right of survivorship), living trusts, retirement plans, or life insurance strategies. Through these structures, ownership transfers without the need for a will, and hence the probate process can be avoided.
- B** Under civil law, ownership is a precise concept that is tempered by statutes that place certain limitations on the free disposition of one's assets. Under forced heirship rules, for example, children have the right to a fixed share of a parent's estate. This right may exist whether or not the child is estranged or conceived outside of marriage. Forced heirship in civil law countries may reduce or eliminate the need for a will. Wealthy individuals may attempt to move assets into an offshore trust governed by a different domicile to circumvent forced heirship rules. Spouses typically have similar guaranteed inheritance rights under civil law forced heirship regimes. In addition, spouses have marital property rights, which depend on the marital property regime that applies to their marriage. Individuals can attempt to reduce or avoid forced heirship by:
- moving assets into an offshore trust governed by a different jurisdiction;
 - gifting or donating assets to others during their lifetime to reduce the value of the final estate upon death; or
 - purchasing life insurance, which can move assets outside of realm of forced heirship provisions.

Such strategies, however, may be subject to “clawback” provisions that provide a basis for heirs to challenge these solutions in court.

- 2 A** Greg and Christine Pearsall's joint survival probabilities are equal to the sum of their individual probabilities less the product of their individual probabilities, calculated as follows:

$$p(\text{Joint survival}) = p(\text{Greg survives}) + p(\text{Christine survives}) - p(\text{Greg survives})p(\text{Christine survives})$$

For each of the next five years, their joint probability of survival is:

Year	Joint $p(\text{Survival})$
1	0.9940
2	0.9874
3	0.9807
4	0.9688
5	0.9551

- B** It is not appropriate to use the expected return of the assets used to fund spending needs to calculate the capitalized value of their core capital needs, because the risk of the Pearsalls' spending needs is unrelated to the risk of the investment portfolio used to fund those needs. Although the annual spending cash flows are not riskless, a risk-free rate should be used to calculate the present value of the cash flows as their uncertainty is unrelated to market risk factors that would be priced in a normal asset pricing model, making their beta equal to zero.
- C** The capitalized value of their core capital needs equals the product of the joint probability of survival and the real spending need for each year discounted using the real risk-free rate. The real risk-free rate is calculated as follows:

$$\text{Real risk-free rate} = [(1 + \text{Nominal risk-free rate}) \div (1 + \text{Inflation rate}) - 1]$$

$$3.7736\% = [(1 + 0.10) \div (1 + 0.06) - 1]$$

Year	Annual Spending	Expected Spending	Discounted Value
1	75,000	74,550	71,839
2	75,000	74,055	68,767
3	75,000	73,553	65,817
4	75,000	72,660	62,654
5	75,000	71,633	59,522
			\$328,599

$$\text{Discounted value} = \frac{\text{Real spending} \times \text{Joint probability}}{(1 + \text{Real risk-free rate})^t}$$

Alternatively, annual spending can be adjusted for inflation and these nominal expected cash flows can be discounted at the nominal risk-free rate.

Year	Annual Spending	Expected Spending	Discounted Value
1	79,500	79,023	71,839
2	84,270	83,208	68,767
3	89,326	87,602	65,817
4	94,686	91,731	62,654
5	100,367	95,861	59,522
			\$328,599

$$\text{Discounted value} = \frac{\text{Real spending} \times (1 + \text{Inflation})^t \times \text{Joint probability}}{(1 + \text{Risk-free rate})^t}$$

Greg and Christine Pearsall have core capital spending needs of \$328,599 for the next five years.

- 3 A** Transferring their investment portfolio assets directly to the third generation (grandson), the Halls may reduce transfer tax liabilities. In jurisdictions that tax gifts or bequests, transfers from the first generation to the second will be taxed. The same capital may be taxed again if it is transferred from the second to third generation and the second generation's estate is taxable.

Transferring capital in excess of the second generation's needs for spending, safety, and flexibility directly to the third generation can avoid a layer of this double taxation. However, in the United States, taxing authorities discourage this strategy by imposing a special generation skipping tax. This tax, in addition to the usual transfer tax, is imposed on transfers to grandchildren or subsequent generations and is intended to produce the same overall tax effect had the assets passed sequentially through two generations.

B

$$\begin{aligned}
 RV_{\text{Taxable Gift}} &= \frac{FV_{\text{Gift}}}{FV_{\text{Bequest}}} \\
 &= \frac{[1 + 0.10(1 - 0.25)]^5 (1 - 0.30)}{[1 + 0.10(1 - 0.30)]^5 (1 - 0.30)} = \frac{1.0049}{0.9818} = 1.02
 \end{aligned}$$

C There is no advantage in delaying payment of the gift because their grandson has a lower marginal tax rate on investment returns compared to the estate's marginal tax rate; the gift still creates a tax advantage if donated today. As their grandson is subject to a lower tax rate of 25 percent, subsequent investment returns will be taxed at a lower rate than if it is kept inside the estate. As the calculation in Solution B indicates, 2 percent more wealth will be created in five years than if the portfolio had remained in the estate and been taxed at 30 percent annually. This analysis assumes that the gratuitous transfer tax is paid by the grandson rather than by the Halls.

4 A *Source tax system:* A jurisdiction that imposes tax on an individual's income that is sourced in the jurisdiction.

Residence tax system: A jurisdiction that imposes a tax on an individual's income based on residency whereby all income (domestic and foreign sourced) is subject to taxation.

B The interaction of countries' taxation jurisdictions can create tax conflicts in which Country A and B can claim to have authority to tax the same investment properties. This conflict can arise in three ways:

- *Residence–residence conflict:* If he were a resident of both countries, Country A and B would both claim residence of Mr. Lloyd, subjecting his worldwide income to taxation by both countries.
- *Source–source conflict:* Both Country A and B may claim source jurisdiction of the same investment properties as income from the investments that are in Country A, but managed from Country B.
- *Residence–source conflict:* Because Lloyd lives in Country B, but has investment properties in Country A, he may be subject to a combination of two taxation jurisdictions. As a resident of Country B he could be taxed on worldwide income; and if Country A exercises source jurisdiction on his assets, he will be taxed on these as well. In this case, the source country (Country A) is commonly viewed to have primary jurisdiction to tax income within its borders and the residence country (Country B) is expected to provide double taxation relief.

C i. In the credit method, the residence country reduces its taxpayers' domestic tax liability for taxes paid to a foreign country exercising source jurisdiction. The credit is limited to the amount of taxes the taxpayer would pay domestically, which completely eliminates double taxation. Under this method the tax liability equals the greater of the tax liability due in either the residence or source country.

If Country A claims source jurisdiction and Country B residence jurisdiction:

$$T_{CreditMethod} = \text{Max}[T_{Residence}, T_{Source}]$$

$$T_{CreditMethod} = \text{Max}[0.30, 0.45] = 45\%$$

In this case, Lloyd remits the entire 45 percent to Country A, which has the source claim.

If Country A were to exercise residence jurisdiction and Country B source jurisdiction, the effective tax rate is the same:

$$T_{CreditMethod} = \text{Max}[T_{Residence}, T_{Source}]$$

$$T_{CreditMethod} = \text{Max}[0.45, 0.30] = 45\%$$

However, Lloyd would remit 30 percent to Country B and apply that remittance toward Country A's 45 percent tax liability, effectively paying Country A 15 percent.

- ii. Under the exemption method, the residence country imposes no tax on foreign-source income by providing taxpayers with an exemption, which, in effect, eliminates the residence–source conflict by having only one jurisdiction impose tax. The tax liability under the exemption method is simply the tax imposed at the foreign source, so the source tax rate prevails:

If Country A is the source country, Lloyd's tax rate is 45 percent.

If Country B is the source country, Lloyd's tax rate is 30 percent.

- iii. Under the deduction method, the residence country allows taxpayers to reduce their taxable income by the amount of taxes paid to foreign governments in respect of foreign-source income (i.e., provides a tax deduction rather than a credit or exemption). The taxpayer is still responsible for both taxes, but the aggregate liability is less than the sum of the two taxes individually with the residence country reducing the size of its percentage claim by the product of the two tax rates.

$$T_{DeductionMethod} = T_{Residence} + T_{Source} - (T_{Residence}T_{Source})$$

$$\text{Country A: Residence jurisdiction and Country B: Source jurisdiction} = 0.45 + 0.30 - (0.45 \times 0.30) = 0.6150$$

Country A receives 31.50% and Country B receives 30%

$$\text{Country A: Source jurisdiction and Country B: Residence jurisdiction} = 0.30 + 0.45 - (0.30 \times 0.45) = 0.6150$$

Country A receives 45%, and Country B receives 16.50%

PORTFOLIO MANAGEMENT STUDY SESSION

13

Private Wealth Management (2)

The wealth of many individuals and families is often concentrated in a limited number of securities, business holdings, or real estate properties. The sale of concentrated positions to facilitate desired diversification may not be feasible or may create a substantial tax liability.

This study session examines the considerations and risks associated with concentrated single asset positions. Strategies for managing concentrated positions in publicly traded common shares, privately held businesses, and real estate are presented. Coverage on the dynamics of human and financial capital and the challenge of meeting financial goals throughout an investor's lifetime follows. The discussion specifically addresses investment strategies and financial products structured to mitigate the risk of not achieving these goals.

READING ASSIGNMENTS

Reading 31

Concentrated Single-Asset Positions
by Thomas J. Boczar, Esq., LL.M., CFA, and Nischal R.
Pai, CFA

Reading 32

Risk Management for Individuals
by David M. Blanchett, PhD, CFP, CFA, David M.
Cordell, PhD, CFP, CFA, Michael S. Finke, PhD, and Thomas
M. Idzorek, CFA

READING

31

Concentrated Single-Asset Positions

by Thomas J. Boczar, Esq., LL.M., CFA, and Nischal R. Pai, CFA

Thomas J. Boczar, Esq., LL.M., CFA, is at Lombard International (USA). Nischal R. Pai, CFA, is at Intelligent Edge Advisors (USA).

LEARNING OUTCOMES

<i>Mastery</i>	<i>The candidate should be able to:</i>
<input type="checkbox"/>	a. explain investment risks associated with a concentrated position in a single asset and discuss the appropriateness of reducing such risks;
<input type="checkbox"/>	b. describe typical objectives in managing concentrated positions;
<input type="checkbox"/>	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;
<input type="checkbox"/>	d. discuss capital market and institutional constraints on an investor's ability to reduce a concentrated position;
<input type="checkbox"/>	e. discuss psychological considerations that may make an investor reluctant to reduce his or her exposure to a concentrated position;
<input type="checkbox"/>	f. describe advisers' use of goal-based planning in managing concentrated positions;
<input type="checkbox"/>	g. explain uses of asset location and wealth transfers in managing concentrated positions;
<input type="checkbox"/>	h. describe strategies for managing concentrated positions in publicly traded common shares;
<input type="checkbox"/>	i. discuss tax considerations in the choice of hedging strategy;
<input type="checkbox"/>	j. describe strategies for managing concentrated positions in privately held businesses;
<input type="checkbox"/>	k. describe strategies for managing concentrated positions in real estate;
<input type="checkbox"/>	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.

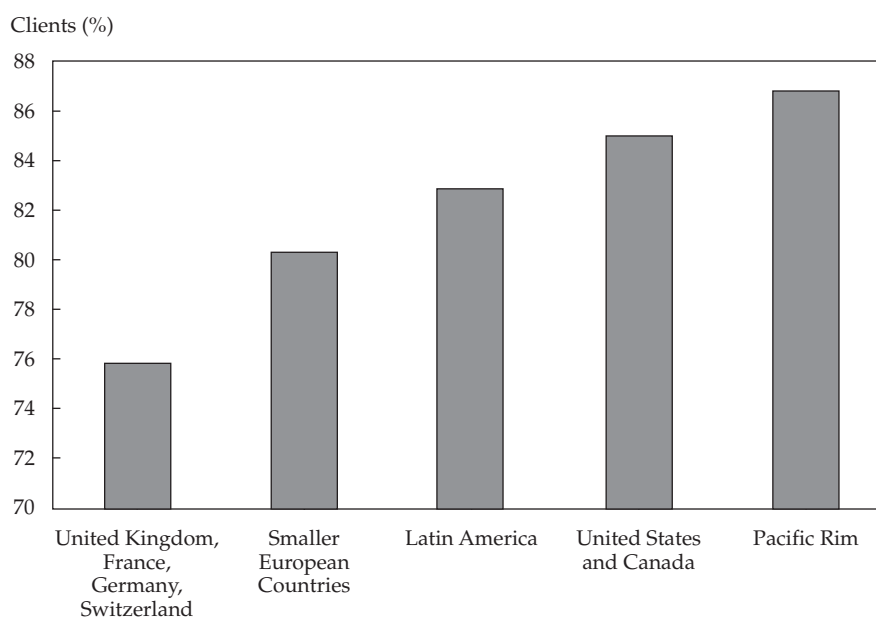
1

INTRODUCTION

Frequently, the wealth of individuals and families is concentrated in an asset or group of assets that has played a role in their (or their forebears') accumulation of wealth. Wealth managers must be able to assist private clients with decisions concerning such positions. The three major types of "concentrated position in a single asset" (or "concentrated position") examined in this reading are (1) publicly traded stock, (2) a privately owned business, and (3) commercial or investment real estate.

Exhibit 1 shows that ownership interests in privately owned business enterprises constitute much of the wealth of private clients in many countries.

Exhibit 1 Percentage of Global Private Clients Who Derive Their Wealth from a Private Business, by Region



Source: VIP Forum, *Strictly Business: Strategies for Acquiring and Serving High-Net-Worth Business Owners* (Arlington, VA: Corporate Executive Board, 2005).

Concentrated positions sometimes make up a large share of a client's net worth. As the owner of a concentrated position ages, the asset may need to be sold or monetized to fund retirement needs, or for risk management purposes. (In general terms, to **monetize** something is to access its cash value without transferring ownership of it, as would be the case in a sale.)

Private clients often want to compare the potential results of continuing to hold these often illiquid assets with selling or monetizing them and reinvesting the proceeds in other asset classes. Wealth managers who understand their clients' finances and personal long-term objectives are ideally suited to play a key role in assisting them to chart an efficient path in handling their concentrated positions.

Creating a globally relevant reading in this field for generalists presents many challenges. Decisions concerning the treatment of concentrated single-asset positions must always be made in the context of a specific single market and tax code. The available means for attempting to achieve a given objective vary across markets, as do tax codes. We show problems that arise worldwide, but the contexts and questions addressed are often simplified. Frequently, US considerations are mentioned, but other

markets are not ignored. This reading provides a familiarity with various recurring themes. Expertise in the field is needed to address real-life problems of concentrated positions. This reading is organized as follows. Section 2 provides an overview of concentrated positions, including how investors typically acquire these assets and the risks inherent in owning them. Section 3 discusses the general principles associated with managing the risk of a concentrated position. Sections 4, 5, and 6 focus on the range of strategies that are available to the owners of concentrated positions in a single stock, private business equity, and real estate, respectively, and Section 7 summarizes the key points of the reading.

CONCENTRATED SINGLE-ASSET POSITIONS: OVERVIEW

2

There is no universally accepted definition of what is meant by a concentrated position. Practically speaking, a concentrated position is one that makes up a significant portion of a private client's net worth. In practice, many wealth managers and fiduciaries consider 25% of a client's net worth to be a relevant threshold, although many use a higher or lower threshold.

Concentration within asset classes poses problems that need to be managed. For instance, a holding of a highly illiquid stock might constitute only a modest portion of a private client's net worth but might be a large percentage of his or her equity exposure. The equity component of the portfolio would then be undiversified and thus entail certain inherent risks. This type of concentration presents risks that also need to be managed.

A concentrated position is often a position that has been held by the private client for a long period, sometimes for decades, and that has greatly appreciated in value over its original cost (cost basis). It will often present tax, liquidity, or other considerations that make a simple sale problematic.

The three asset classes in which concentration risk most commonly arises are

- publicly traded single-stock positions,
- privately held businesses (including family-owned businesses), and
- investment real estate.

Publicly traded single-stock positions. There are a number of ways an investor can end up owning a concentrated stock position. The investor might have worked at a publicly traded company as an executive, perhaps for many years, and received company stock, options, or some other financial instrument that is convertible into company stock as part of his or her executive compensation.

It is also not unusual for the seller of a privately owned business to receive stock in lieu of cash if the acquirer is a publicly traded company. Under many tax regimes, including Japan, the United Kingdom, and the United States, it is possible to structure a purchase using stock without triggering an immediate taxable event. In these situations, the owner goes from holding a highly appreciated position in a privately held stock to a highly appreciated position in a publicly traded stock.

A concentrated position in a publicly traded stock can also come about because of a successful long-term buy-and-hold investing strategy or as a result of a private company that elects to go public through an initial public offering.

Privately owned businesses. Some successful privately owned businesses have been in existence for many years, with ownership passed down from one generation to the next. In other cases, an entrepreneur may have built a successful business in a much shorter period of time, a situation that is not uncommon in such industries as technology and social media.

Investment real estate. Commercial or industrial real estate often constitutes a significant portion of the value of a private business enterprise. It is also often held as a standalone investment by private clients, as in the case of real estate developers. Typically, real estate is held for a long-term period. It is not uncommon when selling or monetizing a business that the buyer does not wish to purchase the real estate component of the business (because, for example, the buyer may already have sufficient space to accommodate the purchased operations). In that case, the seller is left with a large real estate holding.

Concentrated positions in investment real estate could also be derived from inheritance, from a lack of other investment opportunities in certain jurisdictions, or from rapid price appreciation leading to a bubble (e.g., Japan—especially Tokyo—in the 1980s).

Of course, the holder of each of these types of assets might have received his or her ownership stake in the asset through either gifting or inheritance, which is quite common. Ownership of concentrated positions is not a challenge reserved exclusively for private clients. Entities such as trusts, estates, and foundations often hold concentrated positions as the result of a gift or bequest. Pension funds are sometimes exposed to a heavy allocation of the fund sponsor's company stock. Also, publicly traded companies sometimes hold a significant amount of shares of another publicly traded company for business or investment purposes.

2.1 Investment Risks of Concentrated Positions

The owners of concentrated positions face systematic risk and non-systematic risk, which can be company- or property-specific risk. Exposures to any of these risks may not be consistent with the individual's willingness and capacity to bear risk or may be suboptimal with respect to asset allocation.

This section focuses on describing these risks. However, return consequences of concentrated positions can also be important. Some concentrated positions may not be expected to earn fair risk-adjusted returns, for example. There may be large opportunity costs in holding under-performing company stock or non-income-producing land.

2.1.1 Systematic Risk

Systematic risk is the component of risk that cannot be eliminated by holding a well-diversified portfolio. The capital asset pricing model as practically implemented equates systematic risk to equity market risk. More recently developed asset pricing models identify multiple sources of systematic risk; for example, one model based on macroeconomic factors identifies business cycle risk (unexpected changes in the level of real business activity), inflation risk (unexpected changes in the inflation rate), and three other factors, including that part of equity market risk that is unexplained by macroeconomic factors. If the concentrated position has systematic risk exposures that are similar to those of the human capital of the owner of the concentrated position, the individual may be exposed to investment portfolio losses at the same time that job earnings are jeopardized. An example is the founder of a securities firm with a concentrated position in the firm's shares. In a bear market, the firm's earnings and the founder's compensation may be low at the same time that share returns are negative.

2.1.2 *Company-Specific Risk*

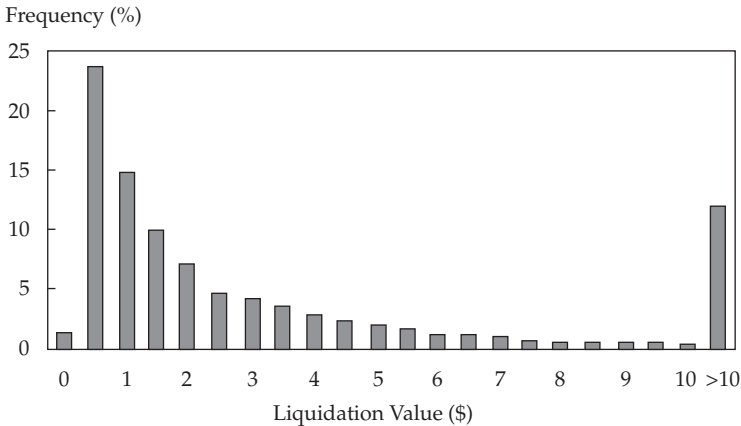
With respect to the ownership of a privately held business and publicly traded stock, we call specific risk **company-specific risk**. Company-specific risk is the non-systematic or idiosyncratic risk that is specific to a particular company's operations, reputation, and business environment. To describe it in another way, it is the possibility that the value of the company may decline because of an event that affects that company but not the industry or market as a whole. Having a concentrated position can expose an individual to an unacceptably high level of company-specific risk. A negative corporate event may result in essentially permanent and irrecoverable losses in wealth. All else equal, the level of company-specific risk is positively related to volatility of returns; company-specific risk can range from relatively low to high for small undiversified or unprofitable companies.

The concept and importance of company-specific risk with respect to a publicly traded company can perhaps best be highlighted through a real life example. During the 1990s, Enron Corporation was one of the most admired companies in the United States. A position in Enron shares returned over 27% per year from 1990 through September 2000, compared with 13% for the S&P 500 Index for the same time period. During this period, thousands of Enron employees participated in the company's defined contribution retirement plan and chose to invest in Enron stock. In January 2001, the retirement accounts were valued at US\$2 billion, of which 62%, or US\$1.24 billion, was invested in Enron shares even though the employees had the option to sell most of those shares tax free within the plan. Between January 2001 and January 2002, Enron's share price fell from about US\$90 per share to zero. On the other hand, the S&P 500 Index declined by only 12% in the same time period.

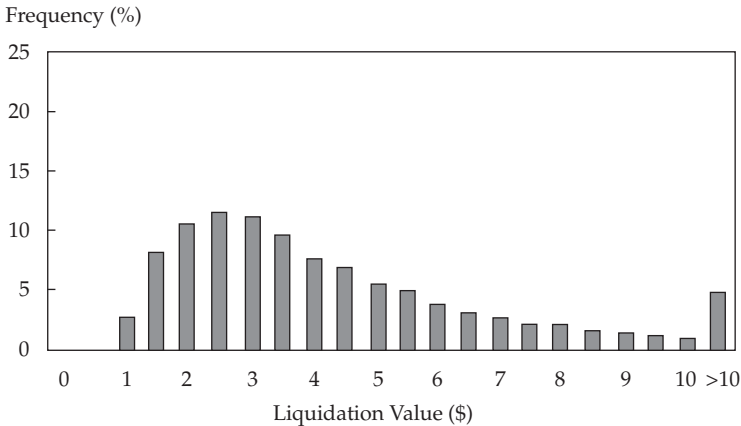
The higher volatility associated with company-specific risk of single-stock holdings significantly lessens the benefit of higher expected capital accumulation over time. For example, Exhibit 2 compares investing a dollar in a single security having a zero cost basis and 40% volatility with the alternative of selling it, paying a 20% capital gains tax, and reinvesting the net proceeds of 80 cents in a diversified portfolio with a volatility of only 17%. Either alternative has an annual expected pretax return of 10%. Exhibit 2 illustrates the comparison at the end of a 20-year horizon.

Exhibit 2 Holding a Security vs. Outright Sale of a Security: Probability Distribution of After-Tax Liquidation Value

A. \$1.00 in Single Security with Zero Cost Basis and 40% Volatility



B. \$0.80 in Diversified Portfolio with \$0.80 Cost Basis and 17% Volatility



Measure	A	B
Expected final value	\$5.3	\$4.2
Median value	\$1.6	\$3.3
Probability of \$1 or less	39%	2%
Probability of \$2 or less	57%	21%

Note: Annual expected return = 10%; dividends on stock = 0; dividends on diversified portfolio = 1.2%; horizon = 20 years; terminal liquidation.
Source: David M. Stein, “Taxes and Quantitative Portfolio Management,” in *Developments in Quantitative Investment Models* (Charlottesville, VA: Association for Investment Management and Research, 2001).

Although the expected value (i.e., arithmetic average) is higher for the single stock, the median outcome is much higher for the diversified portfolio. Moreover, the diversified portfolio has a much smaller chance of suffering large losses. The diversified portfolio strategy has only a 2% chance of losing money, versus a 39% chance for the single stock. As this example illustrates, a “tax minimization” strategy may not be optimal.

2.1.3 Property-Specific Risk

Property-specific risk is the non-systematic risk that is specific to owning a particular piece of real estate. It is the possibility that the value of that property might fall because of an event that could affect that property but not the broader real estate market.

For instance, a potential environmental liability associated with a particular property might be discovered that significantly reduces the value of that property even though the broader real estate market and similar properties are increasing in value.

As another example, an investor might own a large office building that is leased out to a few investment-grade tenants for a long-term period. If the tenants decide not to renew their leases for an additional term when their lease terms expire, the owner may have a difficult time leasing the entire property to a few large investment-grade tenants. Instead, the owner may have to lease the property to a number of smaller tenants, which could take more time, and therefore, a good portion of the property might sit vacant for some time. Also, the new and smaller tenants might not be investment grade, thus increasing the credit risk that the owner must incur in order to fully lease out the building. These types of changes with respect to the tenants/occupancy could negatively affect the resale value of that property even though the broader real estate market and similar office properties are increasing in value.

GENERAL PRINCIPLES OF MANAGING CONCENTRATED SINGLE-ASSET POSITIONS

3

The following sections review certain basic principles that are germane to managing concentrated positions.

3.1 Objectives in Dealing with Concentrated Positions

The financial adviser should first and foremost help clients identify and define their objectives.

3.1.1 Typical Objectives

Irrespective of the form of the concentrated position—whether it is a privately owned business, investment real estate, or a concentrated position in publicly traded stock—there are three objectives that are frequently considered in discussions with the client.

Risk is reviewed and the appropriateness of risk reduction considered. Any adverse results from risk reduction (e.g., loss of control of a business) should be weighed against the benefits. With such qualifications, a frequent (if not universal) objective is to *reduce the risk of wealth concentration*. Psychological considerations are often at work to cause owners to seriously underestimate the riskiness of their concentrated position and significantly overestimate the value of that asset.

Cash flow needs should be identified. An appropriate strategy for monetization and/or risk reduction should be developed. Often, an objective is to *generate liquidity in order to diversify and satisfy spending needs*. Illiquid private business equity, investment real estate, and concentrated stock positions need to be transformed into cash. A replacement source of income then needs to be created to satisfy essential lifetime spending needs. Fulfilling legacy and charitable intentions are also drivers of liquidity needs along with other aspirational desires.

Another typical objective is to *optimize tax efficiency*, which can be accomplished by either structuring transactions involving concentrated positions so as not to trigger an immediate taxable event, or if a taxable event will be triggered, structuring the transaction in a manner that minimizes the tax the owner will incur.

3.1.2 Client Objectives and Concerns

There are many objectives that the owner of the concentrated position might wish to achieve. For instance, the concentrated position could be used in conjunction with gifting strategies to satisfy the owner's wealth transfer desires, such as leaving a legacy for the next generation or to satisfy his or her charitable intentions. The previous section indicated that risk reduction and diversification are common objectives. It is important to note that in order to achieve such objectives, it is *not* always appropriate for the owner to reduce or eliminate the concentration risk of a concentrated position.

With respect to concentrated stock positions, examples of objectives consistent with risk retention include the following:

- An executive might have received shares as part of his or her incentive compensation with the expectation or mandate that those shares be held for a long time period to motivate the executive to work hard as part of a team to grow the company and hopefully result in a much higher stock price in the future.
- The owner of a concentrated position might wish to *maintain effective voting control* of the company.
- The owner of a concentrated position might wish to *enhance the current income* of his or her stock position in the short term but in the long term still retain significant upside potential with respect to the stock.

With respect to privately owned businesses, the following are examples of client objectives:

- An entrepreneur might have recently founded a business, and it would be premature to sell that company because its growth phase has just begun.
- The owner of a mature and stable privately owned business might wish to maintain total control of the company.
- In return for years of prior service, the owner might wish to give senior management and other key employees the opportunity to eventually acquire control of the business.
- The business owner might have plans to pass control of the business to the next generation of his family.

With respect to investment real estate, examples of client objectives include the following:

- Maintain control because the property is an essential asset necessary for the successful operation of a business enterprise.
- Retain ownership in order to pass ownership of the real estate to the next generation.
- Benefit from a recent purchase or development through price appreciation.

3.2 Considerations Affecting All Concentrated Positions

Owners of concentrated positions face numerous constraints and obstacles that must be overcome in order for them to meet their primary and secondary objectives.

3.2.1 Tax Consequences of an Outright Sale

Concentrated positions are often highly appreciated versus their original cost. Therefore, simply selling the asset outright will usually trigger an immediate and sometimes significant taxable capital gain for the owner.

With respect to taxation, the tax cost basis is generally the amount that was paid to acquire an investment or capital asset. It serves as the foundation for calculating capital gain (or loss), which equals the selling price less the tax cost basis. For example, a share of stock bought for 10 monetary units and sold 20 years later for 100 monetary units would generate a capital gain of 90 monetary units.

In the case of concentrated positions, frequently the asset was acquired a long time ago and has a tax cost basis that is much lower than the current fair market value. The asset may therefore have a significant embedded capital gains tax liability.

The key point is that many, but by no means all, tax regimes throughout the world do impose a tax on capital gains.

Given that most families have accumulated the wealth represented by their concentrated positions through many years of hard work and calculated business risks, the fact that an outright sale of those assets would result in a tax obligation is often not psychologically palatable to the family. Therefore, deferring and, if possible, eliminating the capital gains tax is typically a primary objective for investors who own a concentrated position. There are a number of tools and strategies that can be used in many jurisdictions to achieve these objectives.

3.2.2 Liquidity

With the possible exception of concentrated positions in publicly traded stocks, concentrated positions are generally illiquid. This is especially true for the owners of privately owned businesses and investment real estate. Owners of concentrated publicly traded stock positions may also face this illiquidity if the trading volume of the company's shares is small relative to the size of the concentrated position or if the shareholder is an insider and the timing or amount of any sales is restricted by applicable securities laws and regulations.

The sale of private business equity does not resemble the sale of shares of publicly traded stock because the latter trade on established stock exchanges or public trading venues where there are publicly quoted bids and offers and usually many ready buyers and sellers. That is, there is no readily available market for a private company's shares. Rather, a buyer needs to be found for private business equity, and different classes of potential buyers may place a different value on the business. Therefore, the most important factors determining the amount that a business owner will receive when selling his or her business are ultimately the strategy that is employed and who the buyer is.

Direct ownership of investment real estate is also illiquid. A buyer needs to be found for a particular property, and different classes of potential buyers may place different values on that property.

Illiquidity in general acts as a constraint on the choice of strategies for dealing with a concentrated position.

3.3 Institutional and Capital Market Constraints

Various features of the institutional and capital market environment act as constraints on the choice of methods that may be effective in dealing with concentrated positions. Execution of any strategy is dependent on the governing law. The legal relationship that exists between the owners of a business depends on the type of entity that is being used (e.g., sole trader, partnership, limited partnership, or limited company, among other forms, in the United Kingdom), the laws governing that type of entity, and any documentation or agreements those laws require.

3.3.1 Margin-Lending Rules

Margin rules also present obstacles and additional complexity. Margin rules determine how much a bank or brokerage firm can lend against securities positions that their customers own. Various margin regimes exist throughout the world. They can be either rule based or risk based.

Under a *rule-based* system, the amount that can be borrowed against a security that the investor owns will depend on strict rules dealing with the use of the loan proceeds. If the purpose of the loan is to buy additional securities, the maximum loan proceeds are usually quite limited. For instance, in the United States, such a “purpose loan” is subject to a maximum of 50% of the value of the stock that is borrowed against even if that stock is completely hedged by a long put.

In contrast, portfolio margining is an example of a margin regime that is *risk based*. If an investor borrows against a stock that is completely hedged by a long put, the dealer will typically lend close to 100% of the put strike to the investor even if the investor wishes to purchase additional equity securities with the loan proceeds.

The implications of “portfolio margining,” which is available in the United States and other countries, are powerful, especially for ultra-high-net-worth investors. These rules provide advisers with additional flexibility to achieve the desired economic and tax results.

Certain forms of secured lending, such as a **prepaid variable forward** (collar¹ and loan combined within a single instrument) in the United States, are considered “off-balance-sheet” debt and not subject to the margin rules. Such transactions are considered “sales” for margin rule purposes (so the margin rules do not apply and therefore there are no limitations on the use of proceeds) but are structured to not be sales for tax purposes (so capital gains taxes can be deferred or eliminated).

3.3.2 Securities Laws and Regulations

Company insiders and executives must often comply with a myriad of rules and regulations promulgated by governmental authorities. In most countries, such individuals, like any investor, cannot trade on material, non-public information. However, they typically must also comply with certain notice and disclosure/reporting requirements, and there may be specific limitations with respect to the timing and volume of sales or hedging transactions.

3.3.3 Contractual Restrictions and Employer Mandates

Beyond restrictions imposed by securities laws and regulations, contractual restrictions, such as initial public offering “lockups,” and employer mandates and policies, such as a prohibition of trading during certain “blackout periods” (i.e., periods when insiders cannot sell their shares) can greatly restrict the flexibility of insiders and employees to either sell or hedge their shares. In the case of private companies especially, there might be a right of first refusal, meaning that equity holders cannot sell their investment to a third party without first giving other equity investors the right to buy the interest at the same price and under the same conditions that the third party is offering. In addition to the right held by the investors, the entity may also have a right of first refusal, which further reduces the liquidity of an investment holding.

3.3.4 Capital Market Limitations

Certain characteristics of the underlying stock ultimately determine the feasibility of hedging different concentrated positions and in what degree they can be hedged.

¹ A collar is the combination of a long put (to limit potential losses) and a short call (to cap potential gains) below and above their respective strike prices.

The ability to borrow shares is critical because the dealer needs to manage the risk inherent in being a counterparty to the investor's hedge. Managing this risk is achieved by first locating and borrowing the shares and then selling those shares in the marketplace. Although the investor executing the hedging transaction with the dealer could make its long shares available for the dealer to borrow if the shares were not restricted in any manner, the tax authorities could potentially view the transaction effectively as a sale.

In addition, the *liquidity* of the stock is vital because the dealer will periodically adjust its hedge, either borrowing and shorting additional shares or buying back shares and covering some of its outstanding short position. The average daily trading volume of the stock is important, and the dealer will observe whether the shares have had a propensity to “spike” either up or down. Because of this, most dealers will not execute collars or use other hedging techniques with respect to shares of a company that has recently undergone an initial public offering (IPO) because the dealer wants to be able to observe an established trading history/pattern of the stock prior to entering into such a transaction.

3.4 Psychological Considerations²

Various psychological considerations of clients can effectively act as constraints or obstacles to dealing with concentrated positions. Financial advisers hear many different types of rationalizations from their clients for declining to take any action with respect to the concentrated stock positions they own. Following are some common explanations that wealth managers often encounter:

- “It would be terribly disloyal for me to sell the stock after having worked at the company for so many years and the company treated me so well. What would my former colleagues think of me?”
- “My peers will look down on me if I sell the stock.”
- “My husband picked and owned this stock for many years and made me promise before he died that I wouldn't sell it.”
- “I have a duty to pass on ownership of the business to subsequent generations.”

Advisers need to identify the cognitive and emotional biases that are affecting their clients and then communicate effectively with their clients to overcome the sometimes irrational decisions caused by these biases.

3.4.1 Emotional Biases

A number of emotional biases can combine to negatively affect the decision making of holders of concentrated positions, including the following:

- Overconfidence and familiarity (illusion of knowledge)
- Status quo bias (preference for no change)
- Naïve extrapolation of past returns
- Endowment effect (a tendency to ask for much more money to sell something than one would be willing to pay to buy it)
- Loyalty effects

² The discussion within this section draws heavily on the CFA Program Level III readings “The Behavioral Biases of Individuals” and “Behavioral Finance and Investment Processes.”

When biases are emotional in nature, simply drawing them to the attention of the investor is unlikely to lead to a positive outcome; the investor may become defensive rather than receptive to considering alternatives.

To overcome emotional biases, it might be helpful to pose the question, if an equivalent sum to the value of the concentrated position were received in cash, how would you invest the cash? Often, the answer is to invest in a portfolio very different from the concentrated position. It may also prove useful to explore a deceased person's intent in owning the concentrated position and bequeathing it: Was the primary intent to leave the specific concentrated position because it was perceived as a suitable investment based on fundamental analysis, or was it to leave financial resources to benefit the heirs? Heirs who affirm the latter conclusion are more responsive to considering strategies to reduce the concentration risk. It should also prove useful to review the historical performance and risk of the concentrated position.

3.4.2 Cognitive Biases

A number of cognitive biases can combine to negatively affect the decision making of holders of concentrated positions, including the following:

- Conservatism (in the sense of reluctance to update beliefs)
- Confirmation (looking for what confirms one's beliefs)
- Illusion of control (the tendency to overestimate one's control over events)
- Anchoring and adjustment (the tendency to reach a decision by making adjustments from an initial position, or "anchor")
- Availability heuristic (the probability of events is influenced by the ease with which examples of the event can be recalled)

If cognitive errors are brought to the attention of the investor, he or she is likely to be more receptive to correcting the errors.

EXAMPLE 1

Constraints and the Concentrated Position Decision-Making Process

Zachary Sloan, CFA, serves as investment counsel for the Bailer family. Pierce Bailer was formerly the CEO of ABC Corp., a large public company, for over 20 years. During his tenure as CEO, Bailer accumulated a significant position in ABC Corp. stock. Bailer retired as CEO effective 1 January 2010 and continued to serve as a member of the board of directors until his term expired 31 December 2011. Bailer is currently 55 years old and healthy and has a life expectancy of 87 years. He is married to Brooke, who is also 55 and healthy.

Bailer currently owns a 3 million share position in ABC Corp. At the current market price, the position is worth \$60 million and represents 80% of the Bailer family's total investment portfolio, which is worth \$75 million. The other 20% of their portfolio is invested evenly in high-quality fixed-income securities and a diversified portfolio of equities. Bailer has owned the ABC Corp. shares for many years, and the shares have increased significantly in value over that time. In addition, the stock has always paid, and continues to pay, a fairly attractive dividend, currently yielding approximately 2%. The dividend covers most of the Bailer family's day-to-day living expenses. The tax cost basis of the ABC Corp. shares is close to zero, and the sale of the entire position would trigger a tax liability of approximately \$9 million at a capital gains tax rate of 15%.

While Bailer was CEO, he was required by his employment contract and company policy to maintain a large position in ABC Corp. shares, and although occasional sales were permitted, sales and hedging transactions by executives and other employees were frowned upon and discouraged by the board of directors. In fact, it was company policy to encourage retirees to not sell their shares in order to protect the company against a hostile takeover because collectively the shareholder votes of the former employees might help stave off a takeover. In addition, until Bailer left the board of directors, he was deemed an “insider” and the securities laws and regulations limited the timing and amount of any sales or hedging activity. The country in which the Bailer family resides currently has a long-term capital gains tax rate of 15%. Because of the political situation in that jurisdiction and pending legislation, however, the capital gains tax rate is generally expected to increase significantly, very likely to 23%, effective 1 January of the following year. Also, in this jurisdiction, the shares would qualify for a “step-up” in tax cost basis upon the death of the owner. That is, upon inheritance of the shares, the recipient/beneficiary would receive a new tax cost basis equal to the value of the investment asset on the date of death. This new tax cost basis would then be used to compute any future gain or loss on the sale of the investment asset by the recipient/beneficiary.

Even though he no longer has any formal affiliation with ABC Corp., Bailer remains extremely loyal to ABC Corp., is a big fan of ABC Corp. stock, and follows the stock regularly. Although he has no better access to information about the company than any other investor, Bailer feels that he knows the company much better than other investors. Mrs. Bailer remembers that she and Pierce started their married life with a negative net worth and the family’s net worth grew over time as Pierce’s ABC Corp. position skyrocketed in value. Mrs. Bailer also realizes that for many years, the dividends paid on their ABC Corp. stake paid for a good portion of their living expenses.

Immediately following the expiration of Bailer’s term as a member of the board of directors, Sloan suggested a meeting to discuss an alternative asset allocation framework.

- 1 Identify primary investment objectives for the Bailer family’s concentrated single-asset position.
- 2 Identify primary constraints that might impede the Bailer family’s ability to achieve their primary objectives.
- 3 On the basis of the information given, discuss what emotional and cognitive biases may affect decision making of Mr. and Mrs. Bailer.

Solution to 1:

The family owns a concentrated position in ABC Corp. shares that constitutes 80% of their investment portfolio. The first objective should be to significantly reduce the concentration risk. The second objective should be to generate liquidity in order to diversify while satisfying spending needs. The third objective should be to achieve the first two objectives in the most tax-efficient manner.

Solution to 2:

The income tax consequences of an outright sale are a primary constraint to fulfilling the primary investment need. If the entire position was sold this year, a capital gains tax of approximately \$9 million would be incurred. However, if the position is sold on or after 1 January of the following year, a capital gains tax of approximately \$13,800,000 would likely be incurred because of the anticipated increase in the capital gains tax rate—an increase of \$4,800,000. Although the tax is a constraint, the fact that the tax will likely be considerably

higher in the near future should be an impetus for Bailer to sell the ABC Corp. position this year and lock in the current capital gains tax before it increases. The step-up in tax cost basis the shares would receive if Bailer held them until his death should also be considered. However, Bailer's fairly long life expectancy of approximately 32 more years implies that the present value of the step-up is fairly low and should be greatly outweighed by the benefits of diversification over that long-term period.

Solution to 3:

The facts indicate that loyalty effects, overconfidence/familiarity (illusion of knowledge), and confirmation bias could be affecting Mr. Bailer, while status quo bias, naïve extrapolation of past returns, and anchoring and adjustment bias could be affecting Mrs. Bailer. Illiquidity is no longer an issue. For many years and until recently, Mr. Bailer was deemed an "insider" for securities law purposes and the timing and amount of any sales and hedging activity was restricted by applicable securities laws and regulations. In addition, for many years, he was bound by his employment contract and company policies to limit the sale and hedging of his ABC Corp. shares. However, these restrictions were completely eliminated when his term as a member of the board of directors ended.

3.5 Goal-Based Planning in the Concentrated-Position Decision-Making Process

Goal-based planning is one way to incorporate psychological considerations into asset allocation and portfolio construction that can be especially helpful for advisers to clients who own concentrated positions because it can highlight the consequences of selecting an asset allocation that is riskier than is appropriate for a particular investor.

A goal-based methodology expands the traditional Markowitz framework of diversifying market risk by incorporating several notional "risk buckets." Asset allocation, including concentrated positions, subsequently occurs within each risk bucket.³

The first risk bucket can be referred to as the **personal risk bucket**. Here, the goal is protection from poverty or a dramatic decrease in lifestyle. The desire is to achieve almost certainty of protection. Allocations to this bucket limit loss but yield below-market rates of return. This bucket is where the client would allocate his or her home (primary residence), certificates of deposit, Treasury bills, and other "safe haven" investments.

The second risk bucket can be referred to as the **market risk bucket**. Here, the objective is to maintain the current standard of living—to have a high likelihood of maintaining the current status quo. Allocations to this bucket provide average risk-adjusted market returns. This bucket is where the client would allocate his or her stock and bond portfolio.

The third risk bucket can be referred to as the **aspirational risk bucket**. Here, the goal is the opportunity to increase wealth substantially—to have the possibility of moving upward in the wealth spectrum. Allocations to this bucket are expected to yield above-market returns but with substantial risk of loss of capital. This bucket is where the client would allocate his or her concentrated positions, including privately owned businesses, investment real estate, concentrated stock positions, stock options, and the like.

³ For further reading on goal-based planning, see Ashvin Chhabra, "Beyond Markowitz: A Comprehensive Wealth Allocation Framework for Individual Investors," *Journal of Wealth Management*, vol. 7, no. 4 (Spring 2005) and Jean L.P. Brunel, "Goal-Based Wealth Management in Practice," *Journal of Wealth Management*, vol. 14, no. 3 (Winter 2011).

This type of risk allocation framework gives financial advisers a basis to sit down with a client and identify and highlight the significant risk that owners of concentrated positions are subject to. It may be the most effective way to open the conversation with a client about their concentrated positions because it can highlight when allocations to the personal risk and market risk buckets are not adequate.

In addition, concentrated-position owners need a touchstone for deciding whether to sell or monetize, and one useful metric might be whether the proceeds, when combined with the assets the owner already has outside the concentrated position, are at least sufficient to provide for the owner's lifetime spending needs. We can refer to this amount as the owner's **primary capital**, and it comprises allocations to his or her personal and market risk buckets. Ideally, the sale or monetization will generate even more than the primary capital requirement. We refer to this as the owner's **surplus capital**, which comprises allocations to his or her aspirational risk bucket.⁴

To determine whether the sale or monetization of the concentrated position can achieve financial independence for the owner, the financial adviser needs to work with the owner to answer five key questions:

- 1 What are the lifetime *spending needs and desires* of the client after the sale or monetization of the concentrated position?
- 2 How much capital will it take *today* to know that these spending needs and desires will be satisfied throughout the owner's lifetime with little or no chance of the investor running out of money (primary and surplus capital requirements)?
- 3 What is the current value of the concentrated position? Different strategies may result in significantly different values for the concentrated position.
- 4 What is the value of liquid and other assets that are available outside the concentrated position today—that is, how much capital does the owner have now outside the concentrated position?
- 5 Is the current value of the concentrated position under one or more of the monetization strategies that are available to the owner sufficient to “bridge the gap” between the capital the client currently has and his or her primary and surplus capital requirements?

For many concentrated-position owners, it's key to come away from a sale or monetization event with a transaction that has the highest likelihood of meeting at least their primary capital requirement. Generation of surplus capital puts the owner a step ahead.

If wealth managers have a holistic view of their clients' finances, an understanding of their personal long-term financial objectives, and expertise in investment management, they are well situated to assist their clients in determining their primary and surplus capital requirements. Goal-based planning works equally well with clients who own businesses, real estate, and concentrated stock positions. By using this approach, wealth managers can work with clients first to identify and highlight the concentration risk that each client faces and then to create a framework that should prove helpful in determining whether a sale or monetization event would cause the owner of the concentrated position to achieve financial goals. If it would, this approach may give the owner of the concentrated position the impetus to begin dealing with the emotional aspects of selling or monetizing the asset.

⁴ Similar to “surplus capital” is the concept of “discretionary wealth” in Jarrod Wilcox, “Harry Markowitz and the Discretionary Wealth Hypothesis,” *Journal of Portfolio Management* (2003).

EXAMPLE 2**A Business Owner and the Concentrated-Position Decision-Making Process (1)**

Bill Wharton is Fred Garcia's financial adviser. Garcia is 60 years old and is CEO of an aircraft parts business that he founded 30 years ago. For over a decade, Garcia's son had taken on increasingly important responsibilities, and Garcia's exit plan was to pass on the business to his son. His son's sudden decision to pursue other career opportunities was a shock to Garcia and provided the motivation for Garcia to consider selling or monetizing his business.

As Exhibit 3 portrays, Garcia owned a business worth \$40 million, investment real estate consisting of an office building, warehouse, and land used by the business worth \$5 million, a \$3 million stock and bond portfolio, \$1 million in cash, and an unmortgaged home worth \$1 million. Garcia asked Wharton what he thought of his current financial picture.

Exhibit 3 Wealth Distribution Shown in Risk Buckets

"Personal" Risk 4% Protective Assets		"Market" Risk 6% Market Assets		"Aspirational" Risk 90% Aspirational Assets	
Home	\$1,000,000	Equities	\$1,500,000	Family Business	\$40,000,000
Mortgage on Primary Residence	\$0	Intermediate- and Long-Term Fixed Income	\$1,500,000	Investment Real Estate	\$5,000,000
Cash/Short-Term Treasury Bonds and Notes	\$1,000,000				
Total	\$2,000,000	Total	\$3,000,000	Total	\$45,000,000

- 1 Using a goal-based planning framework (i.e., personal, market, and aspirational risk buckets), identify and highlight the significant risk(s) that Garcia is currently facing.

Garcia agreed with Wharton that the current asset allocation seemed very aggressive for someone his age and that it might be time to make some changes. Garcia then asked Wharton what he felt the next step should be in terms of helping to decide whether selling or monetizing his business might make sense.

- 2 Using a goal-based planning framework, describe the initial step that Wharton should work through with Garcia to help determine whether selling or monetizing his business might make sense.

After carefully considering Garcia's lifetime spending needs, Garcia and Wharton determined that a primary capital requirement of \$35 million should be more than sufficient to sustain Garcia's current lifestyle with very little or no risk of running out of capital during his lifetime, even after considering such potential factors as severe market shocks, tax rate increases, inflation, and an unexpectedly

long life span. Later in the reading, after providing the tool set for addressing the problem of obtaining the needed primary capital amount, we will return to Garcia's needs in Example 6.

- 3 Explain how this knowledge—that the sale or monetization should meet Garcia's \$35 million primary capital requirement—should be helpful to Garcia in making a decision as to whether to sell or monetize his business.

Solution to 1:

Garcia currently has 90% (\$45 million out of the \$50 million) of his wealth allocated to a family-run business and commercial real estate, which falls in his high-risk/high-return aspirational risk bucket. That level would qualify as excessive risk taking for someone over 60 years old, especially now that Garcia's son is no longer interested in taking over the business.

Solution to 2:

Wharton should work very carefully with Garcia to determine his lifetime spending needs. They should establish how much capital it would take today to know that Garcia's spending needs would be satisfied throughout Garcia's lifetime with little or no chance of Garcia running out of money. Put another way, they need to ascertain how much capital would need to be allocated to Garcia's personal and market risk buckets (his primary capital requirement).

Solution to 3:

This knowledge is important because Garcia now understands that the sale or monetization of his business should generate sufficient after-tax proceeds to allocate to his personal and market risk buckets to cover his lifetime spending needs and desires. Put another way, Garcia now knows that the sale or monetization of his business can enable him to achieve financial independence as he has defined it.

3.6 Asset Location and Wealth Transfers

The implications of **asset location** (what type of account an asset is held within) for the holders of concentrated positions should be considered. In most tax regimes, a security's asset class usually determines its tax profile when held in taxable accounts. For instance, interest income on fixed-income securities is often taxed differently from long-term capital gains on stocks.⁵ However, the account structure can override the normal tax treatment. Therefore, a relationship exists between deciding what assets to own and in which accounts they should be held. The choice of where to place specific assets is often referred to as the *asset location decision*. It is distinct from the asset allocation decision. The tax regime governing the investor ultimately determines the relative importance of asset location. The concept of asset location and gifting strategies can often be used together to minimize transfer taxes with respect to concentrated positions.

A second tool for addressing concentrated positions is wealth transfers. Undertaking wealth transfer planning *early* in the ownership life of a concentrated position often enables the owner to shift future wealth with little or no transfer tax consequences. Which methods will work depends on the tax regime of the country the owner is subject to, the owner's age and family circumstances, whether he or she is charitably inclined, and whether the planning takes place before or after some value has accumulated.

⁵ Stephen M. Horan and Thomas R. Robinson, "Taxes and Private Wealth Management in a Global Context," Reading 11 of 2013 CFA Program Level III Curriculum.

Advisers who are able to work with clients *before* the concentrated position has appreciated greatly in value can have the most impact. At this point in time, the simplest strategies, such as direct gifts to family members, direct gifts to long-term trusts, and estate freeze strategies, typically add the most value. With the passage of time, after there has been some run-up in the concentrated position's value, wealth transfer tools tend to be less efficient, more complex, and more costly to implement—which underscores the importance of addressing this subject with the owners of concentrated positions as early as possible.

In addition to direct gifting, a valuable concept in wealth transfer planning is that of an early ownership transfer of an estate, or **estate tax freeze**. Here the goal is to transfer *future* appreciation to the next generation at little or no gift or estate tax cost. An estate tax freeze is a plan usually involving a corporation, partnership, or limited liability company in which the owners transfer a junior equity interest to the children that will receive most or all of the future appreciation of the enterprise. Any gift or wealth transfer tax is based on the current market value of the interest transferred; future appreciation of the equity position transferred will not be subject to gift or transfer tax. Estate tax freezes were initially used by closely held family businesses but were later expanded to include other concentrated positions, including publicly traded stocks and real estate.

The classic corporate estate tax freeze involves recapitalizing a closely held family-owned corporation. The older generation, who owns all of the stock of the corporation, exchanges their existing company stock for two newly issued classes of stock. One class is voting preferred; the other is non-voting common. The non-voting common stock is gifted to the next generation. The transaction is structured so that the value of the voting preferred shares is equal to the value of 100% of the corporation. In addition, the value of the preferred stock should not appreciate greatly because those shares pay a fixed rate and resemble a bond. Therefore, the common stock has only a nominal value and can be gifted to the next generation and trigger little or no gift tax. The future appreciation in the value of the corporation should benefit the common shareholders. None of the appreciation is subject to gift or estate tax until the common shares are passed by gift or bequest to the next generation. The parents retain control because all the voting power is held in the preferred shares. The United States, Canada, and Australia, among others, allow some form of a corporate estate tax freeze. Note that although not all jurisdictions allow corporate estate tax freezes, it is the concept that is important, and other techniques have been developed that accomplish the same objectives as the corporate estate tax freeze.

EXAMPLE 3

A Corporate Estate Tax Freeze

John and Barbara Wilson live in a country that imposes a current gift tax of 40% on the transfer of any property directly (or indirectly through trusts) from parents to children that exceeds \$10 million during their lifetimes. The Wilsons have already used the \$10 million exemption by making prior gifts to their children. The Wilsons own a business currently worth \$10 million, but they believe the business is poised for explosive growth that will begin shortly. Their children are already involved with the business. The Wilsons eventually want to pass control of the business to their children, but at this point, they feel their children don't have the necessary experience to run the business, so the Wilsons would like to retain control. However, they would like the growth

that is expected of the business to directly benefit their children, as contrasted with having that appreciation remain in their estate. Based only on the above information, address the following.

- 1 Would a direct gift of the company stock from the Wilsons to their children satisfy their objectives?
- 2 Would a direct gift of the company stock from the Wilsons to a trust set up for the benefit of their children satisfy their objectives?
- 3 Would a corporate estate tax freeze satisfy the Wilsons' objectives?

Solution to 1:

No. They would give up control of the company, which they don't want to do. Because they've already used their \$10 million gift tax exemption, any further gifts would trigger an immediate 40% gift tax.

Solution to 2:

No, for roughly the same reasons stated in the Solution to 1. Although a trust could be set up such that voting control passes on to the children at a later date, a gift tax would still apply.

Solution to 3:

Yes. The Wilsons could recapitalize their company and keep new voting preferred stock (worth the current value of the company) and gift new non-voting common stock (with a current nominal value) to their children with little or zero gift tax due. The Wilsons retain control of the company, and all future appreciation of the company inures to the benefit of their children. Upon the Wilsons's retirement or death, the company can redeem their preferred shares and the common shares can be given voting rights.

Although the greatest opportunities for estate planning and wealth transfer occur before the concentrated position has significantly appreciated, there are techniques the owner can use *after* significant appreciation has occurred to minimize transfer taxes.

A common technique for gifting an interest in a concentrated position is to contribute the concentrated position to an entity such as a family limited partnership. For instance, the parents who own a concentrated position might contribute their concentrated position to a partnership in a manner that does not trigger a current taxable event. The parents retain the general partnership interest and therefore retain control of the partnership and the concentrated position within it. The parents gift the limited partnership interests to their children.

When a limited partnership interest is valued for transfer tax purposes, the value is typically less than a proportionate value of the assets held in the partnership. This discount arises because of two factors. First, there is a *lack of marketability*. Family limited partnership interests are typically restricted and are difficult, if not impossible, to sell outside the family; therefore, an unrelated buyer would very likely not be willing to pay the pro-rata value for the partnership interest. Second, because the general partner retains control, the limited partner's non-controlling *interest* is worth less because he has very little ability to influence management of the partnership and the underlying assets. Because of these two factors, the valuation of a limited partnership interest is often discounted from 10% to 40% of the value of the underlying assets. For instance, assuming a combined discount of 35%, a 20% interest in a \$10 million concentrated position would be transferred at a gift tax valuation of \$1.3 million (i.e., a 35% discount) instead of \$2 million.

In addition to the gift tax savings at the time of transfer, substantial estate tax may be saved if the concentrated position appreciates further between the date of the gift and the date of the parent's death. In the above example, if the \$10 million concentrated position appreciates to \$30 million by the time the donor dies, the children will hold an interest worth \$6 million but only \$1.3 million will be subject to transfer taxes.

Finally, if the owner of the concentrated position is charitably inclined, there are a variety of gifting and asset location strategies that the owner might consider using to avoid triggering any tax (i.e., the capital gains tax on the appreciation), as well as any transfer taxes (i.e., gift and estate taxes).

3.7 Concentrated Wealth Decision Making: A Five-Step Process

Working with the owners of concentrated positions can be quite complex. The following five-step process, if applied systematically to each client holding a concentrated position, should help assure that services are delivered to each client using a uniform and consistent methodology with the result that each client should implement the plan of action or strategy that best satisfies their objectives given their particular circumstances.

- Step 1 **Identify and establish objectives and constraints.** The objective (or combination of objectives) of the owner of the concentrated position should be identified, established, and put in written form. Constraints should be identified and their impact analyzed.
- Step 2 **Identify tools/strategies that can satisfy these objectives.** All the tools and strategies that could be used to satisfy the owner's stated objectives subject to binding constraints need to be identified, while remembering that different techniques can often provide essentially the same economics.
- Step 3 **Compare tax advantages and disadvantages.** The tax advantages and disadvantages of each tool/strategy should be compared.
- Step 4 **Compare non-tax advantages and disadvantages.** The non-tax considerations of each alternative tool/strategy need to be thoroughly compared.
- Step 5 **Formulate and document an overall strategy.** After weighing the tax and non-tax advantages and disadvantages of each alternative tool/strategy, the overall strategy that appears to best position the client to achieve his or her goals is selected.

These steps should be viewed as a dynamic process involving feedback loops so that when an element of the process or circumstance changes, the strategy may need to be adjusted.

4

MANAGING THE RISK OF CONCENTRATED SINGLE-STOCK POSITIONS

Diversification, one of the bedrock investment principles, seeks to balance risk and reward within a portfolio. A portfolio consisting of only a few stocks would not generally be considered prudent because of the risk from the concentrated position. The same reasoning applies to the holder of a concentrated position in a single stock.

To mitigate the risks of any concentrated position, be it publicly traded common stock, ownership of a private business, or ownership of real estate, there are several broad types of tools that can be used:

- Outright sale: Owners can sell the concentrated position, which gives them funds to spend or reinvest but often incurs significant tax liabilities.
- Monetization strategies: These provide owners with funds to spend or re-invest without triggering a taxable event. A loan against the value of a concentrated position is an example of a simple monetization strategy.
- Hedging the value of the concentrated asset: Derivatives are frequently used in such transactions.

Furthermore, a strategy can combine these elements. Exhibit 4 lists the tool set for managing single-stock positions. Selected tools will be discussed in more detail.

Exhibit 4 The Financial Tool Set for Managing a Single-Stock Position

- I. Equity derivatives to hedge value:
 - A Exchange-traded options (sometimes referred to as listed options)
 - B Over-the-counter (OTC) derivatives
 - 1 Options
 - 2 Forwards
 - 3 Swaps
- II. Borrowing to monetize the position:
 - A Margin loans
 - B Recourse and non-recourse debt^a
 - C Fixed- and floating-rate debt
 - D Loans embedded within a derivative (e.g., a prepaid variable forward)
- III. Other monetization:
 - A Short sales against the box
 - B Restricted stock sales
 - C Public capital market-based transactions
 - 1 Debt exchangeable for common (DEC) offerings
 - D Rule 10b5-1 plans and blind trusts (United States)
 - E Exchange funds (United States)

^a Note: Recourse with respect to a debt means there is a right to collect beyond what collateral provides in the event of default against the borrower or some other party.

Please note that the tool set listed above is specific to the United States; investors in other jurisdictions may or may not have access to all of these tools. It is also possible that tools other than those mentioned may be available in other jurisdictions.

4.1 Introduction to Key Tax Considerations

There are a variety of financial tools that investors can use to hedge to achieve a desired economic result. For instance, an investor can synthetically dispose of a stock by shorting the stock directly or, alternatively, by using options, swaps, forwards, or futures.

Although each produces the same economic result, they may not be taxed similarly. Although most tax regimes governing the taxation of financial instruments are comprehensive in nature, they are not always internally consistent.

In most jurisdictions, the basic tax rules applicable to financial products have developed over time in a somewhat piecemeal fashion. The usual process is that investors first innovate and create a new product and the tax authorities later respond. Financial engineers develop a product that begins to trade in the marketplace. Tax authorities soon realize there is no provision in the tax law that currently addresses this particular financial instrument, and they respond accordingly with a tax provision crafted to address this new product.

However, the drafters of such tax laws may not consider that investors might use several different tools to achieve the identical economic objective, so there could be significant differences in the tax treatment among these different tools because of the different provisions that govern them. This is certainly the case in the United States as well as for most other tax regimes.

If there is internal inconsistency of tax codes, there may be an opportunity for well-advised investors to reap substantial tax savings or reduce tax risk by selecting and implementing the *form* of a transaction that delivers the optimal economic and tax result.

4.2 Introduction to Key Non-Tax Considerations

There are certain considerations unrelated to taxation that investors and their advisers need to consider when deciding whether to use an exchange-traded instrument (i.e., options or futures) or an over-the-counter (OTC) derivative (i.e., forward sale or swap).

4.2.1 Counterparty Credit Risk

With respect to an OTC derivative, the investor incurs the credit risk of the single counterparty that he or she contracts with. With respect to exchange-traded instruments, because a clearinghouse (that is typically owned and jointly and severally backed by all its members) is the counterparty and guarantees the instrument, the investor incurs significantly less counterparty credit risk.

4.2.2 Ability to Close Out Transaction Prior to Stated Expiration

The investor can close out exchange-traded instruments prior to their stated maturity by acquiring exactly offsetting positions with any market participant. With respect to OTC derivatives, the investor can attempt to negotiate an early termination of a particular contract, but the counterparty can and usually does extract a concession in return for permitting early termination.

4.2.3 Price Discovery

By their very nature, exchange-traded instruments should achieve robust price discovery. In contrast, an OTC derivative is priced through negotiation with a single dealer, although fiduciaries and advisers should get bids from at least several dealers to ensure that reasonable price discovery has occurred. (Basic financial analysis of derivatives can independently provide a reasonableness benchmark for transaction prices.)

4.2.4 Transparency of Fees

Fees and expenses are more transparent in exchange-traded transactions. All commissions and fees must be identified on trade tickets, trade confirmations, and monthly statements. It is much easier for dealers to build their fees into OTC derivative transactions, especially such instruments as prepaid variable forwards, where the collar and loan are combined into a single instrument.

4.2.5 Flexibility of Terms

OTC derivatives give the investor maximum flexibility with respect to negotiating the key terms and conditions of any transaction. Exchange-traded instruments do not give investors the same degree of flexibility.

4.2.6 Minimum Size Constraints

Exchange-traded instruments typically have a smaller minimum than OTC derivatives. OTC derivatives have a minimum size that is typically around US\$3 million.

4.3 Strategies

There are three primary strategies that investors use in the case of a concentrated position in a common stock:

- Equity monetization
- Hedging
- Yield enhancement

4.3.1 Equity Monetization

Investors holding a concentrated position can (1) hedge against a decline in the price of a stock, (2) defer the capital gains tax, and (3) generate liquidity (cash), which can be used to diversify, by implementing an equity monetization strategy.

Equity monetization generally refers to the transformation of a concentrated position into cash. Equity monetization usually refers to transactions that are designed to empower an investor to receive cash for their stock position through a manner other than an outright sale in a way that avoids triggering a current taxable event.

In addition to avoiding an immediate tax liability associated with an outright sale, there are other factors that might make the use of an equity monetization strategy attractive to a holder of a concentrated position, such as the following:

- The investor may be subject to a diverse array of securities law restrictions that are applicable to a sale of stock.
- The investor might own a large percentage of outstanding shares of the company and may not wish to cede control of the company or give the opportunity to another investor to acquire a large block of company shares.
- The investor may be subject to contractual provisions, such as an IPO lockup or an employment agreement or policy, that prohibit the sale of shares.

Equity monetization entails a two-step process:

- The *first step* is for the investor to remove a large portion of the risk inherent in the concentrated position. The process of hedging the concentrated stock position could be fraught with complex tax regulations. In the United States, for example, the IRS has been known to scrutinize hedging transactions closely, especially for ultra-high-net-worth individuals and families. Care should be taken in structuring the hedge such that the economic incentives (as well as disincentives) of holding the concentrated stock position are not, for practical purposes, eliminated.
- The *second step* is for the investor to borrow against the hedged position. In most instances, a high loan-to-value (LTV) ratio can be achieved because the stock position is hedged; the loan proceeds are then invested in a diversified portfolio of other investments.

4.3.1.1 Equity Monetization Tool Set The four basic tools an investor can use to establish a short position in a stock are⁶

- a short sale against the box,
- a total return equity swap,
- options (forward conversion), and
- a forward sale contract or single-stock futures contract.

For instance, assume an investor owns 1 million shares of ABC Corp. stock and ABC Corp. shares are currently trading at \$100 per share, so the investor is long \$100 million of ABC Corp. shares. To establish an exactly offsetting short position in ABC Corp. shares, the investor could use any of the four techniques mentioned above and described below.

A **short sale against the box** involves shorting a security that is held long. In our example, the investor could borrow 1 million shares of ABC Corp. stock from a broker/dealer and then sell those shares in the marketplace, thus establishing a \$100 million short position in ABC Corp. stock.

Because the investor is simultaneously long and short the same number of shares of the same stock, any future change in the stock's price will have absolutely no effect on the investor's economic position. Likewise, any dividends or other distributions that are received on the long shares are passed through to the lender of the shares that were sold to open the short position.

Because the long and short positions together constitute a riskless position, the investor will earn a money market rate of return on the \$100 million position. The investor has economically transformed the risky ABC Corp. stock position into a riskless asset that will earn a money market rate of return.

Because the short sale against the box creates a riskless (i.e., devoid of price risk) position, margin rules typically allow the investor to borrow with a high loan to value (LTV) ratio against the position. It is usually possible to borrow up to 99% of the value of the stock that is hedged, and there are usually no limitations on the use of the proceeds. The proceeds are typically invested in a portfolio of securities and other investments to achieve diversification. The net cost of borrowing through a short sale against the box is quite low because the interest income earned on the completely hedged stock position greatly offsets the interest expense associated with the margin loan.

The short sale against the box is the least expensive technique that is available to hedge, monetize, and potentially defer the capital gains tax on a concentrated position. It is the "paradigm" among all hedging and monetization strategies. The strategy is less costly than the other tools that enable investors to establish a synthetic short position in a stock (i.e., swaps, options, and forwards/futures, discussed below) because a derivative dealer need not be involved. That is, there are typically fewer dealer fees involved in a short sale against the box versus synthetic short sales.

A **total return equity swap** is a contract for a series of exchanges of the total return on a specified asset in return for specified fixed or floating payments.

In our example, the investor and a derivative dealer could agree to an exchange of cash flows based on a \$100 million notional amount of ABC Corp. shares as follows:

- The investor agrees to pay the dealer any appreciation on her ABC shares plus any dividends and other distributions received on her shares.
- In return, the dealer agrees to pay the investor any loss in the value of the ABC shares plus one-month Libor (less a dealer spread).

⁶ Some of these tools may not be available in practice, depending on the jurisdiction.

Note the similarity to the short sale against the box. The investor is fully hedged and is earning a money market rate of return on the full value of the position. Because a derivative dealer is involved, the money market rate of return earned on the position would likely be slightly less than what would be earned on a short sale against the box position because of the larger dealer spread charged to implement the total return swap. Because the ABC Corp. stock position is completely hedged, monetization with a very high LTV ratio should be possible.

A **forward conversion with options** involves the construction of a synthetic short forward position against the asset held long. This strategy is based on the fact that the payoff of a short forward position is identical to the payoff of a long put and a short call on the same underlying asset.

In our example, the investor could buy ABC Corp. puts and sell ABC Corp. calls with the same strike price (i.e., \$100) and the same termination date covering 1 million shares. By doing so, the investor has locked in a price of \$100 no matter which way the stock moves. If the stock price goes to zero, the investor would exercise the puts, deliver her shares, and receive \$100 from the dealer. If the stock price increased to \$200, the calls would be exercised against the investor; she would deliver shares and receive \$100 from the dealer.

Because the position created is riskless, a forward conversion should be priced in the marketplace to generate a money market rate of return for the investor. Because the ABC Corp. stock position is perfectly hedged, monetization with a very high LTV ratio should be possible.

An **equity forward sale contract** is a private contract for the forward sale of an equity position.

In our example, the investor could agree today to sell her ABC shares to a dealer three years from now. In return, the investor will receive the “forward price” from the dealer three years from now. A forward contract on an individual stock allows the investor to sell her stock at some future date at a guaranteed price (i.e., the forward price). If the market price is above the forward price at the termination of the contract, the investor will receive the forward price and will not participate in any market increase above that price.

Because the position created is riskless, a forward contract will generate a money market rate of return for the investor, which is reflected in the forward price. Because the ABC Corp. stock position is perfectly hedged, monetization with a very high LTV ratio should be possible.

To summarize, by using any of these four techniques, an owner of a concentrated position accomplishes the following:

- A riskless position is created by establishing a direct or synthetic short position covering the same amount of shares that she is long.
- A money market rate of return is generated on the full value of the long position.
- Borrowing against the hedged position with a very high LTV ratio is possible (it is similar to borrowing against a government bond).
- Borrowing is quite inexpensive because the income generated on the hedged position greatly offsets cost of borrowing.
- The borrowed proceeds can be invested in a diversified portfolio.

4.3.1.2 Tax Treatment of Equity Monetization Strategies Equity monetization strategies allow an investor to transfer the economic risk and reward of a stock position without transferring the legal and beneficial ownership of that asset. Put another way, equity monetization can eliminate concentration risk and generate about the same amount of cash that would be generated by an outright sale. The basic premise in most

tax regimes is that economic gains (including unrealized gains on a stock position) do *not* constitute “income” and are therefore *not* subject to tax unless and until they are “realized.”⁷

Historically, the concept of capital gain realization has been tied to the “sale or disposition” of appreciated securities. In the case of monetization transactions, there has been no actual transaction in the appreciated securities themselves. That is, there is no formal legal “connection” between the monetization transaction and the appreciated securities. The investor still owns the securities and, if the securities are viewed in isolation, remains fully exposed to the risk of loss and opportunity for profit associated with the securities. The investor can assert that entering into a monetization arrangement does not, as a matter of legal form, constitute a sale or disposition of the appreciated securities.

The *critical question* is whether an equity monetization strategy will be treated as a taxable event for tax purposes in a particular country. If the tax regime treats the long and short (or synthetically short) position separately for tax purposes, tax on the appreciation of the long position will be deferred. Put more succinctly, if the tax authorities of a country respect legal form over economic substance, which is typically the case, equity monetization techniques should not trigger an immediate taxable event.

A comprehensive comparative tax analysis of how different countries’ tax systems deal with equity monetization strategies is beyond the scope of this reading. However, it is important that advisers, irrespective of the country where their client is domiciled, know how to appropriately appraise equity monetization strategies. Exhibit 5 broadly classifies the various tax regimes that exist in the world today. No matter which tax regime is being examined, certain questions should be asked and a certain process followed as investors and their advisers seek to ensure that the strategy that is used is the most tax efficient. Along these lines, working with the client’s tax adviser to answer the following questions should help in selecting the tool that minimizes the tax cost to the client.

- 1 When unwinding or cash settling the hedge, if there is a gain generated by the hedge, is it short term or long term in nature? Long-term gain is generally preferred in many jurisdictions.
- 2 When unwinding or cash settling the hedge, are potential losses generated by the hedge short term or long term in nature, and is it currently deductible or instead added to the tax cost basis of the shares being hedged? Short-term loss and currently deductible are generally preferred.
- 3 If the contract is physically settled by delivering shares, is the gain short term or long term in nature? Long-term gain is usually better.
- 4 Are the carrying costs associated with monetization (i.e., interest expense or the equivalent) currently deductible or instead added to the tax cost basis of the shares being hedged? Current deductibility is preferred.
- 5 Does the hedge in any way affect the taxation of dividends or distributions received on the shares? No impact is preferred.

⁷ Paul Hayward, “Monetization, Realization and Statutory Interpretation,” *Canadian Tax Journal*, vol. 51, no. 5 (2003).

Exhibit 5 Classification of Income Tax Regimes

Income Tax Regime	1. Common Progressive	2. Heavy Dividend Tax	3. Heavy Capital Gains Tax	4. Heavy Interest Tax	5. Light Capital Gains Tax	6. Flat and Light	7. Flat and Heavy
Ordinary Tax Rate Structure	Progressive	Progressive	Progressive	Progressive	Progressive	Flat	Flat
Interest Income	Some interest taxed at favorable rates or exempt	Some interest taxed at favorable rates or exempt	Some interest taxed at favorable rates or exempt	Taxed at ordinary rates	Taxed at ordinary rates	Some interest taxed at favorable rates or exempt	Some interest taxed at favorable rates or exempt
Dividends	Some dividends taxed at favorable rates or exempt	Taxed at ordinary rates	Some dividends taxed at favorable rates or exempt	Some dividends taxed at favorable rates or exempt	Taxed at ordinary rates	Some dividends taxed at favorable rates or exempt	Taxed at ordinary rates
Capital Gains	Some capital gains taxed favorably or exempt	Some capital gains taxed favorably or exempt	Taxed at ordinary rates	Some capital gains taxed favorably or exempt	Some capital gains taxed favorably or exempt	Some capital gains taxed favorably or exempt	Taxed at ordinary rates
Examples	Austria, Brazil, China, Czech Republic, Finland, France, Greece, Hungary, Ireland, Italy, Japan, Latvia, Malaysia, Netherlands, Nigeria, Philippines, Poland, Portugal, Singapore, South Africa, Sweden, Thailand, United Kingdom, United States, Vietnam	Argentina, Indonesia, Israel, Venezuela	Colombia	Canada, Denmark, Germany, Luxembourg, Pakistan	Australia, Belgium, India, Kenya, Mexico, New Zealand, Norway, Spain, Switzerland, Turkey	Kazakhstan, Russia, Saudi Arabia (Zakat)	Ukraine

Sources: Stephen Horan and Thomas Robinson, "Taxes and Private Wealth Management in a Global Context" (CFA Institute, 2009). Classification based on information provided in International Business Guides from Deloitte Touche Tohmatsu (available at www.deloitte.com) and online database of worldwide taxation provided by PricewaterhouseCoopers (www.taxsummaries.pwc.com).

4.3.2 Lock In Unrealized Gains: Hedging

Hedging is a useful strategy when the holder of a concentrated position would like to protect against downside risk but would also like to capture either unlimited or a significant amount of potential upside with respect to the stock. There are two major hedging approaches investors can consider:

- Purchase of puts
- Cashless, or zero-premium, collar

4.3.2.1 Purchase of Puts Investors holding a concentrated position can purchase put options to (1) lock in a floor price, (2) retain unlimited upside potential, and (3) defer the capital gains tax.

Investors usually buy put options with a strike price that is either at or, more typically, slightly below the current price of the stock (that is, either “at-the-money” or slightly “out-of-the-money” puts). The investor pays an amount, referred to as the premium, to acquire the puts.

Conceptually, this is very similar to the payment of an insurance premium. In return, the investor is fully protected, subject to the credit risk of the counterparty, from any loss resulting from a decline of the stock price below the strike price of the put. The premium paid will vary depending on a number of factors, including the volatility of the stock, the strike price, and the maturity. The investor retains any dividends received and voting rights.

As an example, suppose an investor, Bill, owns shares of ABC Corp. that are currently trading at \$100. ABC one-year put options with a strike price of \$90 currently trade at \$5, and Bill buys these puts. If the stock price has decreased below the \$90 strike price at maturity, the puts can be exercised and Bill will deliver his long shares for \$90 from the exercise of the puts. His total initial investment was \$105—\$100 in stock and \$5 worth of puts. If ABC closes at or above \$90 at expiration, the puts will expire worthless but Bill will have paid \$5 for this “wasting” asset, which can be thought of as “term” insurance. The trade will make sense in retrospect only if the underlying stock price declines below \$85 per share, assuming that no put was purchased.

The concept of combining a long stock position with a long put position is intuitively extremely appealing: downside protection with unlimited upside price participation. However, the out-of-pocket expenditure necessary to acquire puts can be significant. Therefore, investors often seek to lessen their out-of-pocket costs. Described below are a few ways for investors to accomplish this.

The most common way is to lower the strike price. An at-the-money put will cost considerably more than an out-of-the-money put. With an out-of-the-money put, the investor, in essence, “self-insures” down to the strike price. Of course, the lower the strike price, the greater the downside risk the holder retains.

Along similar lines, puts with a shorter maturity will cost less than puts with a longer maturity because the “term insurance” doesn’t last very long.

Another popular strategy is to combine the purchase of put options with the sale of put options with a lower strike price and with the same maturity as the long puts, which is known as a “put spread.” The idea is to lessen the cost of the long puts by selling puts to bring in some premium income in order to partially finance the purchase of the long puts. In this case, the investor will be protected from the strike price of the long put down to the strike price of the short put. However, below the strike price of the short put, the investor is fully exposed to further declines in the underlying stock price.

Another, less frequently used way to lessen the cost of put protection is to use a “knock-out” option. A knock-out put is an “exotic” option that can be acquired only through an over-the-counter dealer (i.e., these types of options are not traded on an exchange). This type of put is less expensive than a “plain vanilla” put because the

protection “knocks out” or disappears before its stated expiration if the stock price increases to a certain level. The rationale for using knock-out puts is that once the stock price increases to a certain level, the downside protection of the put is no longer necessary. Such exotic options can be implemented only for fairly large positions (i.e., there is a high minimum size requirement among the OTC dealers).

However, by far the most common way for stockholders to reduce the out-of-pocket expenditure necessary to achieve the desired downside protection is to enter into a cashless, or zero-premium, collar, which is discussed in the next section.

4.3.2.2 Cashless (Zero-Premium) Collars Investors holding a concentrated position can implement what is commonly referred to as a cashless, or zero-premium, collar to (1) hedge against a decline in the price of a stock, (2) retain a certain degree of upside potential with respect to the stock, and (3) defer the capital gains tax while avoiding any out-of-pocket expenditure. The investor retains any dividend income and voting rights.

Cashless collars are a very popular tool that investors around the globe frequently use to hedge their concentrated positions.

When structuring cashless collars, investors buy puts with a strike price that is either at or, more typically, slightly below the current price of the stock. The investor must pay a premium to acquire the puts and in return is fully protected (subject to the credit risk of the counterparty) from any loss should the stock price fall below the strike price of the puts.

Simultaneously, the investors sell calls with the same maturity with a strike price that is above the current price of the stock and in return receives premium income. The strike price of the calls is set at the level that brings in exactly the amount required to pay for the puts. In other words, the sale of the calls fully finances the purchase of the puts.⁸ Note that investment risk is reduced but not eliminated.

Therefore, although the investor forfeits some of the upside potential of the underlying stock (i.e., the amount the stock price is above the call strike at maturity), by using a cashless collar, no out-of-pocket expenditure is required, and this is perceived to be a huge advantage by most investors and their financial advisers.

Consider again the investor who owns shares of ABC Corp. that are currently trading at \$100. As before, ABC one-year puts with a strike price of \$90 currently trade at \$5. Suppose now that ABC one-year calls with a strike price of \$120 currently trade at \$5. The investor simultaneously sells the calls and buys the puts, with the \$5 premium received for selling the calls fully financing the \$5 premium paid to acquire the puts; therefore, no out-of-pocket expenditure is required.

If the stock price has increased above the \$120 strike price at maturity, the calls will be exercised. In this case, Bill could deliver his long shares and receive \$120 (\$120 from the exercise of the calls plus the \$5 call premium received less the \$5 put premium paid).

If ABC closes between \$90 and \$120 at expiration, both the puts and calls will expire worthless and Bill will have paid the \$5 put premium and received the \$5 call premium. If the stock price decreases below the \$90 strike price at maturity, the puts will be exercised. In this case, Bill could deliver his long shares and receive \$90 (\$90 from the exercise of the puts plus \$5 from the sale of the calls less the \$5 cost of the puts).

⁸ When using exchange-traded put and call options to implement a collar, in almost all cases, there will be two contracts involved: one involving the puts and another involving the calls. The purchase and sale of the puts and calls, respectively, can be executed on an option exchange simultaneously pursuant to what is referred to as a “spread order”—that is, without concern that the investor buys the puts without selling the calls (and vice versa). Nonetheless, on almost all exchanges, there will be two separate contracts involved: one for the puts and one for the calls.

The concept of a cashless collar is very appealing to many investors and advisers. Nevertheless, investors often look for ways to increase the upside potential that is retained.

The most common way to accomplish this is to lower the strike price of the put. The lower the strike price, the lower the premium required to pay for the put. Therefore, a call with a higher strike price can be sold to finance the put purchase, resulting in greater upside potential. Of course, the lower the strike price of the put, the greater the downside risk the holder retains.

Another popular strategy is to combine a “put spread” (described above) with the sale of a call of the same maturity. The idea is to lessen the cost of the long put by selling a put to bring in some premium income to partially finance the purchase of the long put. This, in turn, allows a higher strike price call to be sold in order to fully finance the net cost of the put spread. The investor will be protected from the strike price of the long put down to the strike price of the short put. However, the investor is fully exposed to declines of the underlying stock below the strike price of the short put. In return for taking this risk, the investor will have more upside potential than with a plain vanilla cashless collar.

Along the same lines, investors sometimes pay a portion of the put premium “out of pocket,” which is often referred to as a “debit” collar. It allows a higher strike price call to be sold in order to finance the net cost of the put.

4.3.2.3 Prepaid Variable Forwards A collar hedges the value of the concentrated position. The value of the concentrated position can concurrently be monetized by means of a margin loan. A prepaid variable forward (PVF) where the hedge and the margin loan are combined in one instrument achieves an identical economic result. The margin loan advanced to the client depends on the precise collar structure and its term. A PVF, in essence, is an agreement to sell a security at a specific time in the future with the number of shares to be delivered at maturity varying with the underlying share price at maturity. For example, an investor holding ABC Corp. shares currently trading at \$100 might enter into a PVF requiring the dealer to pay the investor \$88 up front in exchange for the right to receive a variable number of shares from the investor in three years pursuant to a preset formula that embodies the economics of a particular collar (e.g., a long put with a \$95 strike and a short call with a \$110 strike). The formula, in this case, would require the investor to deliver all its ABC Corp. shares if the price of ABC shares in three years is less than \$95. If the price of ABC shares is greater than \$95 but less than \$110, the investor must deliver \$95 worth of shares. If the price of ABC shares is above \$110, the investor must deliver \$95 worth of shares plus the value of the shares above \$110.

Alternatively, a PVF can be cash settled. If the price of ABC shares is less than \$95 three years from now, the investor will pay the dealer the then-current value of ABC shares in cash. If the price of ABC shares is between \$95 and \$110, the investor will pay the dealer \$95 in cash. If the price of ABC shares is above \$110, the investor will pay the dealer \$95 plus the difference between the then-current price of ABC shares and \$110. The investor could enter into another PVF to get the liquidity to satisfy its obligations under the original PVF. A PVF combines the economics of a collar and a borrowing against the underlying stock within a single instrument.

EXAMPLE 4

Hedging a Concentrated Position

Rachel LeMesurier recently retired from Denton Corp., where she experienced a long and successful tenure as a senior executive. During her 30-year career with Denton Corp., LeMesurier received a considerable portion of her compensation in the form of Denton Corp. shares. She currently owns 100,000 shares of Denton Corp. stock, which are currently trading at \$40 per share.

LeMesurier has decided that she would like to hedge the risk of her \$4 million position ($= 100,000 \text{ shares} \times \40) in Denton stock. LeMesurier has been exploring various hedging alternatives with her financial adviser and feels that a cashless collar will give her the downside protection that she needs while still allowing her to participate to a certain extent should the price of Denton Corp. shares increase.

LeMesurier and her financial adviser know that there are two types of options: exchange traded and over the counter (OTC).

LeMesurier likes the transparency of exchange-traded options, as well as the fact that her counterparty will be a clearinghouse that is owned and guaranteed by all the exchange members as opposed to a single dealer, which means there is less counterparty risk when using exchange-traded options.

Currently, Denton Corp. one-year exchange-traded puts with a strike price of \$36 are trading at a premium of \$3 per share, and Denton Corp. one-year exchange-traded calls with a strike price of \$48 are trading at a premium of \$3 per share. Through her financial adviser, LeMesurier submits a spread order to simultaneously sell the calls and buy the puts covering her entire \$4 million Denton Corp. stock position, with the \$300,000 premium received for selling the calls fully financing the \$300,000 premium required to purchase the puts.

The price of Denton Corp. shares traded in a range during most of the one-year period the collar was in place. On the expiration date of the collar, Denton Corp. shares closed at \$42, and both the puts and calls expired worthless on that date.

In the country where LeMesurier is domiciled, like many other countries, the tax code does not treat all financial instruments that achieve the same economic result the same. The tax code in her country treats the call premium received on short calls as a current short-term capital gain whereas the premium paid to acquire puts is treated as a deferred long-term capital gain that merely increases the tax cost basis of the shares that were hedged.

1 Can this treatment result in a less-than-optimal tax result?

In the jurisdiction where LeMesurier is domiciled, OTC derivatives, including options, forwards, and swaps, are taxed more favorably than exchange-traded options. For instance, a forward contract or a swap could be used to achieve the same collar-like economics. By their very nature, the embedded call and put premiums are netted, and the economics of a long put/short call structure are built into a single contract, with the premiums automatically netted.

OTC options could also be used to implement a collar. Because the terms of such a collar are negotiated with a single dealer, the transaction could be structured and documented as a single contract, with the premiums effectively

netted out. The trade confirmation for either type of collar will not show the cost of the call and put separately but will instead show a net cost of zero. Most option exchanges do not yet allow collars to be structured as a single contract.

- 2 Could OTC derivatives deliver a potentially more tax-efficient result than exchange-traded options?
- 3 Would there have been a cost to LeMesurier if she decided to implement her collar with OTC derivatives in lieu of exchange-traded options?

Solution to 1:

Yes. Because LeMesurier used exchange-traded options, she faces an immediate taxable gain on the expired calls. More specifically, the \$300,000 premium LeMesurier received on the sale of the calls will be taxable in the year the options expired as a short-term capital gain.

However, because the tax code does *not* permit LeMesurier to deduct the \$300,000 premium paid to acquire the puts in the year the options expired, the put premium instead increases her tax cost basis in her Denton Corp. shares. Therefore, LeMesurier gets the tax benefit of her loss on the puts only when she sells those shares, and she has no plans to sell her Denton Corp. shares.

Solution to 2:

Yes. If LeMesurier had used a collar based on OTC derivatives documented as a single instrument in lieu of exchange-traded options, she could have achieved a more tax-efficient result. Instead of being currently taxed on \$300,000 of short-term capital gains and having deferred long-term capital losses of \$300,000, which was added to her tax cost basis, LeMesurier could have had no taxable event at all had she used an OTC derivative and documented the collar properly.

Solution to 3:

Yes, the cost to LeMesurier of using an OTC derivatives-based collar in lieu of exchange-traded options is that the non-tax advantages (e.g., lower counterparty risk, transparency in pricing) of exchange-traded options are forfeited. However, many investors in LeMesurier's situation feel this is a fair price to pay for the enhanced tax efficiency that an OTC derivative-based collar documented as a single instrument can deliver in certain jurisdictions.

4.3.2.4 Choosing the Best Hedging Strategy The tax characteristics of the shares or other instrument that is being hedged can help determine which strategy will deliver the optimal result for the client.

To illustrate, it is not unusual for employees to receive compensation in the form of either restricted company shares or various forms of employee options to acquire common shares of their employer in the future. Because these types of instruments are received as compensation for services rendered, tax regimes often tax these types of instruments differently from common shares that have been held as an investment asset for a long-term period by an investor. For instance, restricted shares and employee stock options are often treated in a manner similar to other forms of compensation income, such as salary and bonus. These types of "ordinary income" are often taxed at significantly higher rates than long-term capital gains income.

A key tax issue that arises when hedging restricted shares and employee stock options is the potential tax inefficiency that can result if the instrument being hedged and the tool that is being used to hedge it produce income and loss of a different character. This problem is called a **mismatch in character**.

For example, when an employee exercises employee stock options, any gains are typically treated like cash salary and bonus—that is, as ordinary income. In contrast, most derivative-based hedging tools give rise to capital gains or losses. Therefore, in some jurisdictions, the use of a derivative-based collar to hedge employee stock options can create the potential for ordinary income on one hand (i.e., the employee stock options) and capital losses on the other (i.e., the derivative-based hedge). That is, if the underlying stock continues to appreciate above the strike price of the employee stock option, the investor will have ordinary income on the stock option and a capital loss on the hedge. Unless the employee has capital gains from other sources, the loss may not be currently deductible because capital losses are generally deductible against capital gains, not against ordinary income.

EXAMPLE 5

Mismatch in Character

David Hawk, a senior executive at US-based Garner-Price Corp., receives a large portion of his compensation in the form of stock options. These options will be taxed as ordinary income upon their exercise. Hawk decides to hedge his employee stock options using an option-based collar. During the period the collar is in place, the employee stock options increased in value by \$10 million above the strike price of the collar.

- 1 Taking no account of either potential tax implications or the net cost of the collar, has Hawk benefitted economically from this increase in value?
- 2 Explain the problem of “mismatch in character” in hedging.
- 3 Describe the mismatch in character that potentially affects Hawk.

Solution to 1:

Economically and taking no account of potential tax implications, Hawk has not benefited from this increase in value because the \$10 million of additional income on his employee stock options is exactly offset by the \$10 million loss on the collar.

Solution to 2:

A mismatch in character occurs when the gain or loss in the concentrated position and the offsetting loss or gain in hedge are subject to different tax treatments.

Solution to 3:

When the collar expires and Hawk exercises his employee stock options, he will have an additional \$10 million of ordinary income and \$10 million of capital losses from the collar, resulting in a mismatch in character between the employee stock option income (ordinary) and the losses on the hedge (capital). Unless he has sufficient capital gains, he won't be able to fully use those losses.

Therefore, while this option-based collar provided the desired economics (downside protection), it also resulted in \$10 million of ordinary income in the current year with no offsetting deduction.

In Example 5, Hawk's strategy was subject to a mismatch in character that implied taxes would be payable at ordinary income rates. Is there a possible solution to this dilemma? That is, is it possible to avoid such a mismatch in character? The answer depends on the tax treatment of alternatives to the collar used. In the United States, Hawk could consider a swap that has the optionality of a collar embedded within it.

If the stock price rises above the embedded call strike, the investor will incur a loss on the swap. If the investor makes a payment to the dealer to terminate his obligation under the swap, depending on application of local tax law, the termination payment may or may not be treated as a deduction from ordinary income. With the appreciation of the employee stock options treated as ordinary income, if the loss on the swap is treated as a deduction from ordinary income, no mismatch in character would occur.

The key point is that the tax attributes and characteristics of the shares or other instrument that is being hedged can influence the decisions as to what hedging tool should be used and how the transaction should be documented.

4.3.3 Yield Enhancement

Investors can enhance the yield of a concentrated stock position while decreasing its volatility by writing covered calls against some or all of the shares.

Investors typically sell call options with a strike price that is above the current price of the stock and in return receive premium income. The amount of premium received will vary depending on a number of factors, including the volatility of the stock, the strike price, and the maturity. The investor retains any dividends received on the shares and voting rights.

The strategy effectively allows the investor to *establish a liquidation value* (the strike price) for the shares he or she writes call options against. However, the investor does retain full downside exposure to the shares (to the extent the stock price decreases by more than the premium received) and has capped the upside potential (the call strike price plus the premium received).

For example, suppose that Denton Corp. shares are currently trading at \$100. Denton Corp.'s one-year call options with a strike price of \$120 currently trade at \$5, and Rachel LeMesurier sells these call options. If the stock price has increased above the \$120 strike price at maturity, the calls will be exercised and LeMesurier will deliver her long shares. In that case, she will receive a total of \$125: \$120 upon the exercise of the calls and \$5 from the initial sale of the calls. If Denton Corp. closes at or below \$120 at expiration, the calls will expire worthless and LeMesurier will retain the \$5 premium and the long shares. The end result is that LeMesurier is better off so long as the stock price at call expiration is below \$125 (i.e., the strike price plus the call premium received).

Covered call writing is often viewed as attractive if the holder believes the stock will be stuck in a trading range for the foreseeable future. Covered call writing can be a good substitute for a structured selling program. Many financial advisers recommend that investors simply set multiple price targets today and sell a fixed number or percentage of their shares if and when the stock price reaches the previously established price targets. Essentially, the same economics can be achieved by entering into a covered call writing program (i.e., by selling call options with staggered maturities and strike prices), but the economics are considerably improved because the investor receives the call premium.

Perhaps the most significant benefit of implementing a covered call writing program, even if only on a portion of the concentrated position, is that it can *psychologically prepare the owner to dispose of those shares*.

4.3.4 Other Tools: Tax-Optimized Equity Strategies

Tax-optimized equity strategies seek to combine investment and tax considerations in making investment decisions. They start with the generic concept of tax efficiency and quantitatively incorporate dimensions of risk and return in the investment decision-making process. In the context of managing the risk of a concentrated stock position, these strategies are used in two primary ways: (1) as an index-tracking strategy with active tax management and (2) in the construction of completeness portfolios.

An index-tracking separately managed portfolio is funded by cash, from a partial sale of the investor's concentrated stock position, from the monetization proceeds derived from the hedged stock position, or a combination of any of these. The portfolio is quantitatively designed to track a broad-based market index (e.g., the S&P 500 Index) on a pre-tax basis, and outperform it on an after-tax basis. The goal from an investment-return perspective is not to perfectly replicate the benchmark but to track it closely. Furthermore, these strategies use opportunistic capital loss harvesting and gain deferral techniques that can be used by the holder of the concentrated stock position to sell a commensurate amount of stock without incurring any capital gains taxes.

In contrast, a completeness portfolio incorporates the risk characteristics of the concentrated stock position to build a portfolio such that the combination of the two portfolios tracks the broadly diversified market benchmark to the best extent possible. The completeness portfolio minimizes correlation with the concentrated stock by not including similar industry and sector bets. Capital loss harvesting in the completeness portfolio allows a concurrent sale of the concentrated stock position without a tax liability. Over time, the size of the concentrated stock position is whittled down to zero, whereas the completeness portfolio becomes an index-tracking one.

This strategy is certainly one way for an investor to diversify out of a concentrated position, but it does come with certain risks and costs.

First, and most importantly, this strategy is intended to be implemented over time, so the investor continues to retain the company-specific risk of the remaining, albeit a progressively diminishing, concentrated stock position.

Second, in a perfect world (that is, assuming the concentrated stock position does not decrease precipitously early on during this process and the index proxy manager performs well), the best possible result will be that the client moves from holding a single low-basis stock to holding a diversified portfolio of lower-basis (i.e., not current) stocks. Hence, when this diversified market portfolio needs to be liquidated, there could be a tax associated with it.

4.3.5 Other Tools: Cross Hedging

In certain circumstances, it may not be possible for an investor to directly hedge a position. For instance, the derivatives required to accomplish this task may not exist in the marketplace or may be prohibitively costly to execute or the securities laws may preclude an insider or affiliate from executing a hedging transaction. In such a case, the investor might wish to consider an indirect or **cross hedge** by using derivatives on a substitute asset with an expected high correlation with the investor's concentrated stock position.

After a careful analysis of a pool of securities with characteristics similar to the investor's stock position, a security or basket of securities could be selected that have the highest correlation with the investor's concentrated stock position. Another alternative would be to select a broad or targeted index that is investable to serve as the substitute asset.

By using a cross hedge, the investor is at least able to hedge market and industry risk. However, the investor retains all of the company-specific risk of the concentrated position.

Investors considering a cross hedge should probably limit themselves to purchasing puts on the proxy asset even though this will entail an out-of-pocket cost. If a cashless collar or short position is used, the investor is exposed to considerable risk should the concentrated stock position drop in value because of factors specific to that company while the proxy asset or index increases in value. In that case, if the proxy asset or index increases above the call strike or short-sale price, the investor is responsible for that amount when the stock position is down in value.

As always, all else being equal, the investor should use the derivative tool to implement the transaction that should deliver the desired economics in the most tax-efficient manner.

4.3.6 Exchange Funds

An exchange fund is an investment fund structured as a partnership in which the partners have each contributed their low-basis concentrated stock positions to the fund. Each partner (contributor to the fund) then owns a pro rata interest in the partnership potentially holding a diversified pool of securities. Participating in the exchange fund is not considered a taxable event; the partners' cost basis in the partnership units is identical to the cost basis of the contributed concentrated stock positions. For tax purposes, each partner must remain in the fund for a minimum of seven years, after which he or she has the option to redeem his or her interest in the partnership and receive a basket of securities at the discretion of the fund manager equal in value to the pro rata ownership of the partnership or continue his or her investment in the fund.

5

MANAGING THE RISK OF PRIVATE BUSINESS EQUITY

As Exhibit 1 depicted, although there is slight variation from region to region throughout the world, a high percentage of private clients derive their wealth from the ownership of a privately owned business. Indeed, owning or controlling a private company can be a very exciting and rewarding experience for its owners. However, as discussed previously, business owners are exposed to a significant degree of concentration risk and illiquidity. Furthermore, they often significantly underestimate the risks inherent in owning and managing their businesses and may overestimate the value of their businesses.

Before a discussion on the risk concentrations of owning a privately held business, it is important to note that sale or divestiture of that business can have many more motivations apart from risk management compared with someone who owns a concentrated stock position, for instance. Some of these other considerations might include the time and effort needed to manage the business, the potential or disposition of heirs to succeed the business owner, and a myriad of other human, emotional, and family issues. It is prudent for an adviser to be cognizant of these non-investment issues before educating the business owner of the risks of his or her concentration.

Business owners are often asset rich but relatively cash poor. That is, many private company owners have most of their personal net worth tied up in their businesses. The owners quite often would like to generate liquidity to diversify in other investments in order to reduce their concentration risk. But there is likely little or no liquidity among the existing shareholders, and in fact, there is likely a prohibition against selling shares to anyone other than the company or its existing shareholders.

As they age and approach retirement, many business owners come to appreciate the high risks they face in continuing to own and operate their businesses and realize they must soon sell or otherwise monetize their private business equity to fund their retirement lifestyles. In many cases, the owner's shares are likely to be highly appreciated versus their tax cost basis, and accessing meaningful liquidity can, and often does, trigger an immediate and sometimes significant taxable event. In addition, generating liquidity can, and often does, result in a loss of control or dilution of one's ownership stake. Exhibit 6 lists major tools for dealing with a concentrated business equity position.

Exhibit 6 The Financial Tool Set for Managing Private Business Equity

Strategies that are available to allow company owners to generate full or partial liquidity include

- Sale to third-party investor:
 - Strategic buyer
 - Financial buyer
 - Other investor
- Sale to insider:
 - Management (management buyout, or MBO)
 - Employees (employee stock ownership plan, or ESOP, in the United States)
 - Sale or transfer to next generation of family
- Recapitalization
- Divestiture of non-core assets (often real estate)
- Personal line of credit against company shares
- Initial public offering (IPO)

These strategies use different *sources of capital* that can include

- Senior debt
- Mezzanine debt (debt that is subordinate to other debt including senior debt)
- Equity

The conduciveness of the market for business sale and monetization transactions varies greatly over time. At any given point in time, many factors determine the attractiveness of the market from the seller's perspective, including

- Valuation level of target companies (at, above, or below historical norms)
- Tax rate applicable to a particular exit strategy
- Condition of the credit markets
- Level of interest rates
- Amount of buying power in the marketplace (strategic and financial buyers)
- Currency valuation

5.1 Profile of a Typical Business Owned by a Private Client

Most businesses owned and managed by private clients can be characterized as “middle-market” businesses. There is no universally accepted definition of the term “middle-market,” but these are businesses that are privately owned and worth anywhere from \$10 million to over \$500 million.

The business often comprises the bulk of the owner's net worth. For instance, the private client might have a liquid portfolio of \$3 million but own and manage a business that is worth \$30 million. Real estate can often form a significant portion of the assets and value of the business. Alternatively, real estate may be held individually and leased to the business.

The business is typically the owner's primary source of income and a means to fulfill legacy and charitable objectives. It is also usually a source of pride and personal identity for the business owner.

5.2 Profile of a Typical Business Owner

It is very difficult to generalize regarding business owners, but there are some commonalities that are worth noting. The business and personal lives of business owners are usually entangled because of the demands of managing and operating the business. Family members and business partners are often involved. Long-term objectives can vary and often change quickly.

Owners often underestimate the risks inherent in running their businesses. There is also a tendency to overestimate the value of their enterprise. Often the business has been owned and managed by the family for many years or decades. The owner has probably received unsolicited inquiries from potential buyers in the past.

In many cases, a business owner may not have an exit plan in place. The owner may know little about the process that should be used in deciding whether, when, and how to sell, monetize, or otherwise transfer the business. Aging aside, an unforeseen event may trigger the owner into action. Such events can include

- an unsolicited inquiry or offer from a competitor,
- illness of the owner or a family member, or
- the realization that a son or daughter does not wish to work in the business.

5.3 Monetization Strategies for Business Owners

Most business owners and their financial advisers are not familiar with the range of strategies that can be used to monetize their private business equity. Rather, most incorrectly assume that it is a "sell or hold" decision. In addition, most believe it is a one-time decision. It is possible, by using certain techniques, to implement an exit plan that is staged or phased over time to generate liquidity in more than one event. Conditions in the capital markets and the merger and acquisition deal market will ultimately influence the attractiveness of these strategies, and these factors differ greatly over time.

5.3.1 Sale to Strategic Buyers

Strategic buyers are competitors or other companies involved in the same or a similar industry as the seller. Most strategic buyers tend to take a long-term view of their investments in other companies. Because of this fact, they will typically pay the highest price for a business because of potential revenue, cost, and other potential synergies.

Strategic buyers are usually quite active in the marketplace, executing "add-on" or "fill-in" acquisitions, many of which involve middle-market companies. Strategic buyers view these types of acquisitions as a low-risk way to enhance revenue and earnings growth and view them as especially attractive in a slow growth environment.

5.3.2 Sale to Financial Buyers

Private equity firms are often referred to as **financial buyers** or financial sponsors. Private equity firms typically raise funds from institutional investors which they manage within investment funds known as private equity funds. They are investment advisers. They make direct investments in mature and stable middle-market businesses. They look for companies that provide the opportunity for them to create significant value.

Private equity firms typically will not pay as high a price as a strategic buyer primarily because they do not have the same opportunity as strategic buyers to take advantage of financial and operational synergies. They target earning a high internal rate of return on their invested capital over a fairly short period of time, typically three to five years, at which time the company will ideally either be sold to a strategic buyer or go public. To achieve their return targets, private equity firms have to be careful to not overpay at the outset.

5.3.3 *Recapitalization*

A leveraged recapitalization is a strategy that is especially attractive to middle-market business owners who would like to reduce the risk of their wealth concentration and generate liquidity to diversify but who are not yet ready to exit entirely and have the desire to continue to grow their businesses.

A **leveraged recapitalization** is essentially a leveraging of a company's balance sheet, usually accomplished by working with a private equity firm. The private equity firm generally invests equity and provides or arranges debt with senior and mezzanine (subordinated) lenders.

The owner transfers a portion of her stock for cash and retains a minority ownership interest in the freshly capitalized entity. Doing so allows the owner to monetize a large portion of her business equity (typically 60–80%) and retain significant upside potential (20–40%) from that point forward. Because of the retained stake, the owner should remain highly motivated to grow the business.

From a tax perspective, the owner is typically taxed currently on the cash received. If structured properly, a tax deferral is achieved on the stock rolled over into the newly capitalized company. This strategy should be especially appealing to business owners who are considering cashing out in the near future and are domiciled in jurisdictions where tax rates are either scheduled to increase in the near future (such as Japan, at the time of writing) or viewed as likely to increase in the near future (such as the United States, at the time of writing).

The after-tax cash proceeds the investor receives could be deployed into other asset classes to help build a diversified portfolio.

A recapitalization is an example of a “staged” exit strategy in that it allows the owner to have two liquidity events, one up front and another typically within three to five years, when the private equity firm seeks to cash out its investment (which could be an IPO, a sale to a strategic or financial buyer, or another recapitalization). Because the owner is now partnering with a resource-rich private equity firm, the owner can focus on growing the business and will no longer have to personally guarantee bank debt. The owner does relinquish overall control of the company but may maintain day-to-day operating responsibility for the business and retains his or her title, salary, benefits, and reputation in the community as a successful entrepreneur.

Private equity firms are increasingly investing in middle-market companies. The recapitalization has become their vehicle of choice for doing so. For all these reasons, recapitalization is an attractive alternative to an outright sale to a third-party buyer.

5.3.4 *Sale to Management or Key Employees*

A group of senior managers or employees can acquire control of a business from the company owner through a management buyout (MBO).

For a sale to senior management or a group of key employees, the current owner knows the abilities of the key employees and the employees know the inner workings of the company. However, a serious risk is that these key employees may not, in fact, be successful entrepreneurs. That is, once the risk of owning and running the business is completely on their shoulders, they may not perform as hoped, and this is a huge uncertainty. For this reason, it is usually very difficult for senior managers and key employees to obtain financial backing from private equity firms and financial

institutions; therefore, they usually cannot raise sufficient funds to make a serious cash offer. In most instances, the amount offered by management/employees rarely matches the sum offered by a third party if a third party is bidding.

As a result, in management buyout situations, the owner is often asked to finance a substantial amount of the purchase price in the form of a promissory note with a significant portion of the purchase price therefore deferred and sometimes contingent on the financial performance of the company. The negotiations often end when the owner sees the mix of consideration offered by the employees, typically a very low cash component and a large promissory note, and realizes the considerable risk he or she would be taking by selling to management/employees with unknown entrepreneurial capabilities and then acting as creditor to them.

Another important consideration is that because the owner is negotiating with people who work for him or her, a failed attempt to do an MBO has the potential to negatively affect the dynamics of the employer–employee relationship.

As a general rule of thumb, unless the owner has accumulated sufficient investable assets outside the business to sustain his or her desired lifestyle after the sale of the business, an owner should probably sell to key management/employees only if the pricing, terms, and conditions of their purchase offer matches or exceeds that of a third-party buyer.

5.3.5 Divestiture (Sale or Disposition of Non-Core Assets)

If a business owner is not yet ready to retire and wishes to continue to run the business but would like to generate some liquidity now in order to diversify, the owner may wish to sell or dispose of non-core assets. Non-core assets can be broadly defined as those that are not essential to the continued operation or growth of the company. This process is often referred to as a divestiture.

For instance, a company may be considering the possibility of exiting a certain line of business or closing a division that does not fit in with the future growth plans of the company, yet this business line or division may have value to a competitor. As another example, a company may hold real estate used for company operations that has a greater value in an alternative use. For example, agricultural real estate located near population centers may have a greater value when developed as residential or commercial property than in continued agricultural use.

5.3.6 Sale or Gift to Family Member or Next Generation

Private company owners can sell or transfer their business, usually through a combination of tax-advantaged gifting strategies, to a family member or members who are typically actively involved in the business.

Family members may not have the necessary capital to buy the business. It is difficult for family members to obtain the financial backing of private equity firms or financial institutions for the same reasons senior management has difficulty obtaining financing to implement an MBO. Family members usually cannot raise sufficient funds to make an acceptable cash offer. If a sale does occur, the owner may carry a significant portion (sometimes all) of the purchase price in the form of a promissory note.

Gifting strategies are often used to transfer ownership to the next generation. However, unless the owner has accumulated sufficient investable assets outside the business to sustain his or her desired lifestyle without regard to the business, gifting might not be feasible.

5.3.7 Personal Line of Credit Secured by Company Shares

The owner might consider arranging a personal loan secured by his or her shares in the private company. This option is usually completely overlooked, yet it can be an attractive alternative to the other strategies.

One of the key benefits is that this type of borrowing should not cause an immediate taxable event to the company or the owner if structured properly. This technique basically uses corporate debt capacity (assuming it is available) to avoid a taxable stock sale or dividend.

The transaction is usually structured with a “put” arrangement back to the company to make the lender comfortable. The company can support this put obligation either through its existing credit arrangement or with a standby letter of credit issued for this specific purpose.

The exercise of the put to the company as a source of repayment of the loan would likely be considered a taxable event to the business owner. Also, at some point the debt will need to be repaid.

In the interim, the owner maintains full ownership and control of the company, has access to cash to diversify his or her concentration risk, and avoids triggering a taxable event. In addition, in most jurisdictions, the interest expense paid on the loan proceeds should be currently deductible for tax purposes.

5.3.8 Going Public through an Initial Public Offering

An initial public offering (IPO) is possible if the company is in an industry deemed attractive by investors and has a history of steady and significant growth.

The costs associated with going public are significant, although the pricing received in numerous instances more than offsets these costs. Importantly, the privacy and authority that many private business owners find attractive and have come to take for granted are eliminated. The owner will be the CEO and an employee of a publicly traded company and will be subject to significant scrutiny. Any and all decisions are open for the investment community to question. The necessity and pressure to meet short-term quarterly revenue and earnings expectations of the investment community cannot be overstated.

As a general rule, if the owner’s objective is to exit from the company in the near term, an IPO is not a viable exit strategy. Rather, an IPO should be viewed as a financing tool that can be used to grow and take the company to a new level, assuming the owner wishes to remain actively involved in the company at least for the foreseeable future.

5.3.9 Employee Stock Ownership Plan

In some countries, legislation has been enacted that makes it attractive for a business owner to sell some or all of his or her company shares to certain types of pension plans.

For instance, in the United States, an employee stock ownership plan (ESOP) is a qualified retirement plan (i.e., a form of pension plan) that can be created by the company and is allowed to buy some or all of the owner’s shares of company stock.

In a version known as a leveraged ESOP, if the company has borrowing capacity, the ESOP borrows funds (typically from a bank) to finance the purchase of the owner’s shares.

US tax rules permit the deferral of the capital gains tax for a sale of stock to an ESOP, which can be an attractive benefit to the owner. However, this deferral benefit is available only to the shareholders of “Subchapter C” corporations, the details of which are beyond the scope of this reading.

The tax deferral benefit, combined with a possible step-up in basis at death (i.e., the elimination of tax on the capital gains), can make this strategy quite compelling for the owners of a Subchapter C corporation.

An ESOP is another example of a staged or phased exit strategy in that the company owner does not have to sell all of his or her shares to the ESOP. By using an ESOP, the owner can partially diversify his or her holdings, in a tax-advantaged manner, and diversify while retaining control of the company and maintaining upside potential in the retained shares.

Despite several potential disadvantages, including setup and maintenance costs, the strategy of selling shares to an ESOP, where it is a feasible strategy, can be attractive.

5.4 Considerations in Evaluating Different Strategies

In evaluating different strategies, the objective should be to maximize the after-tax proceeds that are available to the business owner to re-invest as opposed to simply maximizing the sales price. Astute transactional tax planning and structuring is extremely important and can result in significant tax savings for the owner.

The strategies described above may result in different values for the company that is being sold or monetized. The sale of private business equity differs from the sale of shares of publicly traded stock, where the shares trade on an established stock exchange and there are ready buyers and sellers. Rather, a market needs to be created for private business equity, and the potential buyers discussed above may place different values on the business and different equity interests therein. Therefore, the most important factor determining the amount that the business owner will receive after monetizing the business is the strategy that is ultimately used. As stated previously, a strategic buyer will typically pay the highest amount for a business.

The bulk of the consideration received by the business owner pursuant to a sale or monetization transaction is typically paid up front, but it is not uncommon for a portion of the purchase price, sometimes a significant portion, to be deferred or even to be contingent upon the occurrence of certain future events. For instance, the seller might lend the buyer a portion of the purchase price. Another example is when the seller and buyer agree to bridge the gap between what they each feel the company is worth by using an “earn-out.” With respect to an earn-out, the payout is based on the company meeting or exceeding certain milestones, such as revenue or earnings targets. If the targets are met, the seller receives the post-closing payment (which may have been held in escrow). Therefore, when considering the “sale price,” one must consider how much is paid up front in cash (or stock) and how much is deferred or contingent (and how likely it is that it will actually be received). As indicated, after-tax amounts are relevant to decision making. Example 6 builds on Example 2.

EXAMPLE 6

A Business Owner and the Concentrated-Position Decision-Making Process (2)

Recall that Fred Garcia had been persuaded by his financial advisor, Bill Wharton, that a sale to a strategic buyer or a recapitalization would satisfy his primary capital requirement of \$35 million. Wharton then introduced Garcia to an investment banking firm to explore all exit strategies. The following facts were established:

- The government in Garcia’s country is expected to increase the tax rate on capital gains, effective the following year.
- Garcia wants to spend more time with his family.
- Garcia is very attached to his identity as CEO of an aircraft business.
- Garcia believes that if his company had a capital infusion, his company would be positioned to triple its earnings within several years.

The financial data are shown from Exhibit 3, repeated here.

Exhibit 3 Wealth Distribution Shown in Risk Buckets (repeated)

"Personal" Risk 4% Protective Assets		"Market" Risk 6% Market Assets		"Aspirational" Risk 90% Aspirational Assets	
Home	\$1,000,000	Equities	\$1,500,000	Family Business	\$40,000,000
Mortgage on Primary Residence	\$0	Intermediate- and Long-Term Fixed Income	\$1,500,000	Investment Real Estate	\$5,000,000
Cash/Short-Term Treasury Bonds and Notes	\$1,000,000				
Total	\$2,000,000	Total	\$3,000,000	Total	\$45,000,000

- 1 Discuss which factors favor a sale to a strategic buyer and which factors favor a recapitalization.

Suppose that Garcia decides on a recapitalization. Garcia receives 80% of the value of the company in cash from a private equity firm, taxed at the current 15% capital gains tax rate. Investment real estate is included in the transaction. Assume that \$10 million of proceeds are added to Garcia's personal risk bucket and the remaining balance of proceeds is added to his market risk bucket. The private equity firm shares Garcia's optimism about the potential growth of the company and is ready to extend debt financing to it on favorable terms.

- 2
 - A Calculate the (after-tax) amount monetized by the recapitalization and the value of his stake in the business immediately after recapitalization.
 - B Explain the meaning of primary capital in this context. Evaluate whether the amount monetized, combined with his existing portfolio, meets Garcia's requirement for \$35 million in core capital. Justify your answer.
- 3 Describe a likely management objective of the recapitalized company.

Solution to 1:

These facts favor a sale to a strategic buyer:

- In a sale, Garcia would be relieved of the day-to-day pressure of owning and running the business and therefore have more time to spend with his family.
- A sale to a strategic buyer would generally realize the highest current proceeds. A sale now would avoid the expected higher tax rate.

These facts favor a recapitalization:

- Garcia would retain his highly valued identity as CEO of his firm.
- A recapitalization could raise capital that would allow the expansion to realize a major increase in earnings and value of the company within a relatively short time frame.

Solutions to 2:

- A** Sales price \times Percent of equity sold \times (1 – Tax rate) = \$45 million \times 0.80 \times (1 – 0.15) = \$30.6 million, which is the amount monetized. The value of Garcia’s 20% stake is \$9 million before any possible valuation discounts for the lack of control or limited marketability of the shares.
- B** Primary capital is the sum of the personal risk bucket and the market risk bucket. Yes, the recapitalization will meet Garcia’s primary capital needs. The personal risk bucket becomes \$2 million + \$10 million = \$12 million. That leaves \$30.6 million – \$10 million = \$20.6 million. The market risk bucket is \$3 million + \$20.6 million = \$23.6 million. Primary capital is \$12 million + \$23.6 million = \$35.6 million. Exhibit 7 diagrams the allocation of Garcia’s wealth after the recapitalization with some assumed asset allocations of the invested proceeds.

Exhibit 7

“Personal” Risk 27% Protective Assets		“Market” Risk 53% Market Assets		“Aspirational” Risk 20% Aspirational Assets	
Home	\$1,000,000	Equities	\$6,000,000	20% Interest in	\$9,000,000
Mortgage on Primary Residence	\$0	Intermediate- and Long-Term Fixed Income	\$6,000,000	Recapitalized Business	
Inflation Indexed Treasury bonds	\$5,000,000	Alternative Investments	\$11,600,000		
Cash/Short-Term Treasury Bonds and Notes	\$6,000,000				
Total	\$12,000,000	Total	\$23,600,000	Total	\$9,000,000

Note how Garcia’s risk allocations have changed: 27% to personal risk, 53% to market risk, and only 20% to aspirational risk based on the new after-tax portfolio value of \$44.6 million. Note also, however, that Garcia’s net worth on paper has declined 10.8%, from \$50.0 million to \$44.6 million, as a result of gains realization and portfolio realignment decisions.

Solution to 3:

With the capital the private equity firm may add through a debt infusion, if growth expectations are realized, the private equity firm may seek to exit from its investment by either going public or selling out to a strategic buyer several years down the road. This second exit could be very profitable for Garcia.

EXAMPLE 7

Short Sale against the Box

Sam Smith, age 73, is the founder and 100% owner of ScreenTime, Inc., a technology company. The investment banker of Peak Products, Inc., a publicly traded competitor, has approached Smith with a two-pronged offer to buy. Smith engages the investment banker, Beverly Capital (BC), to evaluate Peak's offer. Other pertinent facts are as follows:

- One offer is \$300 million, all cash, for all of Smith's shares.
 - A second offer is \$350 million in Peak shares in exchange for all of Smith's shares, with no cash consideration.
 - The capital gains tax rate is 25%.
 - BC advises that, as structured, the second offer qualifies as a tax-free stock swap (i.e., a type of business sale transaction that does *not* trigger an immediate taxable event). The tax cost basis that Smith has in ScreenTime shares, essentially zero, would become his tax cost basis in Peak shares transferred to the Peak shares.
 - Although referred to as a tax-free stock swap, the actual result is a deferral of the capital gains tax. That is, a taxable gain would occur if and when Smith sold his Peak shares.
 - Smith is domiciled in a country where the current tax regime allows for a stepped-up basis in shares held at the time of the investor's death. That is, upon Smith's death, the Peak shares received by Smith's estate or beneficiaries would receive a tax cost basis equal to fair market value on the date of Smith's death. Thus, at death, accrued gains permanently escape income taxation.
 - Smith is unwilling to bear the risk of holding Peak shares. Suppose that if Smith accepts a tax-free stock swap, he is able to sell the Peak shares short against the box. He would realize 99% of the value of the Peak shares with no limitations on the use of proceeds. The after-tax cost to access the proceeds would be locked in at 30 bps per year. Smith would be able to keep the position in place indefinitely.
- 1 Discuss the implication of Smith's unwillingness to bear the risk of the Peak shares.
 - 2 Determine the value of the all-cash offer.
 - 3 Determine the value of the tax-free stock swap offer with immediate sale of the Peak shares.
 - 4 Determine the value of the tax-free stock swap offer with a short sale against the box.
 - 5 Recommend a strategy to Smith.

Solution to 1:

The implication is that Smith needs to consider the all-cash offer, the tax-free stock swap offer with immediate sale of Peak shares, or the tax-free stock swap offer along with a long-term hedging strategy to remove the risk of Peak shares.

Solution to 2:

The all-cash offer is worth $\$300 \text{ million} \times (1 - 0.25) = \225 million .

Solution to 3:

The tax-free stock swap offer with immediate sale of Peak shares is worth $\$350 \text{ million} \times (1 - 0.25) = \262.5 million (assuming the block of stock can be sold without any adverse price impact and ignoring the cost to sell the Peak shares).

Solution to 4:

This strategy monetizes $0.99 \times \$350 \text{ million} = \346.5 million at a cost of $0.0030 \times \$346.5 \text{ million} = \1.04 million per year.

Solution to 5:

The tax-free stock swap offer in exchange with short selling against the box realizes the greatest value for Smith. The 25% capital gains tax will be indefinitely deferred, and if the shares are held until death, the capital gains tax will be eliminated because the Peak shares will receive a step-up in basis upon Smith's death. At that point, Smith's estate could close the short position, and no tax would be due. With Smith well into his 70s, the present value of the step-up in basis should be fairly high.

6

MANAGING THE RISK OF INVESTMENT REAL ESTATE

Real estate can constitute a significant portion of the value of a business. It can also be held as a stand-alone investment. Real estate can also constitute a significant portion of a private client's net worth.

Real estate owners are often exposed to a significant degree of concentration risk and illiquidity. In addition, real estate owners may underestimate those risks and overestimate the value of their properties.

Real estate owners may want to generate liquidity to diversify and reduce their concentration risk. Especially as they age and approach retirement, real estate owners may better recognize the risks inherent in owning real estate and the benefits of selling or otherwise monetizing their property to fund their retirement.

The owner's property is likely to have been held for a long period and to be highly appreciated versus its original tax cost basis. Accessing meaningful liquidity may trigger recognition of a tax liability.

Various forms of debt and equity financing are the primary capital markets tools that investors use to facilitate monetization events involving their real estate investments. Mortgage financing can be recourse or non-recourse and can be either fixed rate or floating rate. The conduciveness of the market for investment real estate sale and monetization transactions varies over time. At any given time, numerous factors determine the attractiveness of the market from the seller's perspective including the following:

- Current valuation of real estate relative to historical levels and future expectations
- Tax rate applicable to a particular property and transaction
- Condition of the credit markets and lending conditions
- Level of interest rates

6.1 Monetization Strategies for Real Estate Owners

As for private businesses, the strategies that real estate owners can use to monetize their properties include exit plans that are staged or phased to generate liquidity in more than one event. Real estate monetization decisions should never be motivated solely for tax reasons. The business or investment rationale for the transaction needs to make sense. If it does, then the next step is to explore the most tax-efficient execution.

6.1.1 *Mortgage Financing*

Besides an outright sale, which is the most common strategy, the use of mortgage financing is the next most common technique investors use to lower concentration in a particular property and generate liquidity to diversify asset portfolios without triggering a taxable event.

Consider an investor who owns a high-quality, income-producing property with a fair market value of \$10 million. Suppose that the property has a tax cost basis close to zero. An outright sale of the property, given a capital gains tax rate of 25%, would result in the investor receiving \$7.5 million in after-tax proceeds from the sale. The investor would have no further benefit if the property increased in value in the future.

As an alternative to an outright sale, the owner might obtain a fixed-rate mortgage against the property. He could seek to set the LTV (loan to value) ratio at the point where the net rental income generated from the property equaled the fixed mortgage payment (composed of interest expense and amortization of the loan principal). Assuming this cash flow–neutral LTV ratio is 75%, the investor could monetize \$7.5 million of the real estate’s value with no limitations on the use of the loan proceeds. The proceeds could be invested in a liquid, diversified portfolio of securities. The loan proceeds will not be taxed because they are not “income” for tax purposes. In addition, the net rental income derived from the property exactly covers the cost of servicing the debt and other expenses of the property, so the net income from the real estate is zero. Therefore, there are no income tax consequences from the transaction. If the value of the real estate increases over time, the investor will be able to borrow more against the property without triggering a taxable event.

If the investor is able to structure the borrowing as a *non-recourse loan* (meaning that the lender’s only recourse upon an event of default is to look to the property that was mortgaged to the lender), the investor has economically acquired the equivalent of a put issued by the lender with a strike price of \$7.5 million that has been 100% monetized, thereby reducing her concentration risk in the property.

Borrowing against appreciated, income-producing real estate, especially on a non-recourse basis, can be an attractive technique to effectively “realize” unrealized real estate gains. In lieu of selling the asset outright to realize the gain and trigger an immediate taxable event, the owner can often borrow against the property to access the same or a similar amount of proceeds that a sale would have generated but without paying any tax—and often with a net cost of carry close to zero—while capturing 100% of any increase in the property’s value.

6.1.2 *Real Estate Monetization for the Charitably Inclined*

The implications of asset location for taxable investors can be significant. Asset location is not a concept that is applicable only to securities. Rather, asset location is important for concentrated positions, including real estate. For instance, financial advisers serve many clients who are charitably inclined, and there are many tools and techniques that can be used under different tax regimes to achieve their philanthropic goals that involve asset location.

In the United States, if a client would like to build a significant endowment fund over the next few years and allow the assets to grow tax free until grants are made, the use of a **donor-advised fund** (DAF) can deliver a very attractive result. For example,

suppose an investor owns a rental property that is worth \$2 million. The investor wants to endow a named professorship at the university from which he graduated several years ago. The amount needed to fund the professorship is \$3 million. Especially if the investor believes that the property's growth prospects are less compelling than those of some other asset classes (e.g., publicly traded securities), the investor might decide to contribute the property directly to a DAF. If the property is then sold by the DAF to be invested in those more promising investments, there will not be an immediate taxable event. The appreciation forever escapes taxation. Nor are the accumulated depreciation deductions taken by the investor ever "recaptured." Therefore, the full \$2 million would be available to invest and manage. Importantly, those proceeds grow tax free because the DAF qualifies as a charitable organization. In addition, the investor would qualify for an immediate \$2 million charitable contribution deduction with a potential value of \$700,000, given an applicable 35% income tax rate.⁹ When the target of \$3 million is reached, the DAF could then fund the professorship at his alma mater.

Similarly, in most common law jurisdictions, a tax-exempt charitable trust would achieve the same purpose as a DAF. The trust would have a defined and charitable purpose, the contributor would receive a tax deduction from the donation to trust, and the trust would not be taxed on property sale proceeds or investment income emanating from the property.

6.1.3 *Sale and Leaseback*

A **sale and leaseback** is a transaction wherein the owner of a property sells that property and then immediately leases it back from the buyer at a rental rate and lease term that is acceptable to the new owner and on financial terms that are consistent with the marketplace. In a typical transaction, a corporation will sell its real estate asset(s) to another party, which could be a real estate investment trust (REIT) or an institutional or private investor, and then lease the property back at a rental rate based on current market conditions.

The primary goal of a sale and leaseback is to raise capital or free up the owner's equity (that is invested in the property) for other uses while retaining use of the facility. When credit markets tighten (as they did throughout the world in 2008), sale and leasebacks may still be available for raising capital for business owners who are occupants of office buildings, manufacturing facilities, and industrial warehouse facilities.

The potential benefits of a sale and leaseback include the following:

- 1 It provides a source of capital to distribute to shareholders.
- 2 It provides 100% of the value of the asset compared with traditional mortgage debt financing, which rarely exceeds 75% unless the tenant is investment grade from a credit perspective. However, a taxable event is triggered and the after-tax proceeds will be less than 100% unless the company has a capital loss that can shield the gain from taxation.
- 3 The owner can redeploy the capital into the core focus of the business, and doing so may yield greater returns than would be generated by real estate investment.
- 4 Any debt that was associated with the real estate is removed from the balance sheet.
- 5 There is typically complete rental payment deductibility for tax purposes, meaning that rental payments under a sale and leaseback structure are typically 100% deductible against the company's taxable income, versus only the interest expense component of a mortgage payment. Sale and leasebacks have flexible lease terms—usually 10–20 years with built-in renewal options.

⁹ Any unused deduction can be carried forward for an additional five years.

In sum, for individuals who wish to monetize their real estate assets to fund a liquidity event for shareholders, to invest the capital in their core business, or to use it for other strategic purposes, a sale and leaseback can be an attractive financing alternative to traditional lending sources.

6.1.4 Other Real Estate Monetization Techniques

There are many real estate monetization techniques that are available but are outside the scope of this reading, including joint ventures, condominium structures, and sales of buildings with the seller retaining control through a long-term ground lease. In the United States, it is possible to implement what is referred to as a “monetizing tax-free exchange,” which effectively allows a holder of an appreciated property to hedge, monetize, and defer and eventually eliminate the capital gains tax.¹⁰

EXAMPLE 8

Refinancing or Sale Leaseback?

Albert Lee is the owner of a medium-size business and is seeking to raise capital to facilitate the growth of the business. Lee wishes to either (1) sell and leaseback or (2) refinance his free and clear warehouse to raise capital. The warehouse is worth \$5 million. Assume the following facts:

- By refinancing, Lee can achieve an LTV ratio of 75% and raise \$3.75 million. By using a sale and leaseback, Lee can raise, on a pre-tax basis, 100% of the value of the warehouse, or \$5 million.
- The warehouse is owned by Lee, not by the business, and is not key to the success of the business.
- Lee has \$5.0 million of capital losses to carry forward, resulting in a deferred tax asset of \$1.5 million related to capital loss carryforwards.
- The capital gains tax rate is 25%.

State and justify two reasons in favor of a sale and leaseback (to the corporation) rather than a refinancing.

Solution:

(1) Lee can realize \$1.25 million more through a sale and leaseback. (2) The warehouse is not a key business asset.

If Lee refinances the warehouse, he can deduct the interest expense and defer the payment of any taxes. However, the maximum amount he can raise is \$3.75 million = \$5 million \times (1 – 0.25). If the sale and leaseback is used, without any capital loss carryforwards, Lee would monetize \$3.75 million, but he would also have to pay the capital gains tax. However, the \$1.5 million in capital loss carryforwards could be used to fully offset the 25% capital gains tax of \$1.25 million. Thus, a sale and leaseback would realize \$5 million. Note that with a sale and leaseback, Lee can deduct the annual lease payment. If the warehouse was a key business asset, that would be a point in favor of refinancing, which would leave Lee with full ownership and control over the property. However, that is stated not to be the case.

¹⁰ In the United States, a variation of the traditional 1031 tax-free exchange, a “monetizing 1031 exchange,” can be attractive for investors who wish to hedge, monetize, and defer and possibly eliminate the capital gains tax on their real estate investment.

SUMMARY

Much of the wealth owned by private clients throughout the world is held in the form of concentrated single-asset positions (concentrated positions), which include concentrated positions in publicly traded stock, privately owned businesses, and investment real estate.

- Owners of concentrated positions can face significant investment risks, including systematic, company-specific, and property-specific risk. Concentrated positions are also typically illiquid.
- There are three primary objectives that concentrated position owners should address. The first is to reduce the risk of wealth concentration by diversifying asset holdings. The second is to generate sufficient liquidity within a portfolio to meet current and future spending needs. The third is to optimize tax efficiency.
- Investors face many constraints when managing a concentrated position, including the income tax consequences of an outright sale, the inherent illiquidity of concentrated positions, and psychological considerations, such as the existence of any cognitive or behavioral biases.
- The concept of asset location and gifting strategies can often be used together to minimize transfer taxes for concentrated positions. Advisers able to work with clients *before* the concentrated position has appreciated greatly in value can have the most impact. With the passage of time, after there has been some increase in the concentrated position's value, wealth transfer tools, while still useful, tend to be less efficient, more complex, and more costly to implement, which underscores the importance of planning the management of an owner's concentrated positions as early as possible.
- There are often several economically equivalent ways to hedge or monetize a concentrated single-stock position. Because tax regimes governing the taxation of financial instruments differ, the tax results might be disparate. Investors can reap substantial tax savings or reduce tax risk by selecting and implementing the *form* of a transaction that delivers the optimal tax result.
- When hedging a concentrated single-stock position, investors can use either exchange-traded instruments (i.e., options or futures) or over-the-counter (OTC) derivatives (i.e., options, forward sales, or swaps). Each has its own advantages and disadvantages.
- Equity monetization refers to the transformation of a concentrated stock position into cash. Equity monetization usually refers to transactions designed to generate cash through a manner other than an outright sale in a way that avoids triggering a current taxable event.
- Equity monetization entails a two-step process. The first step is to remove most of the risk of the concentrated position. That is, the investor establishes a nearly riskless position in the stock. The second step is for the investor to borrow against the hedged position. In most instances, a high loan-to-value (LTV) ratio is achieved because the stock position is hedged and the loan proceeds are then invested in a diversified portfolio of other investments.
- The four basic equity monetization tools are (1) short sales against the box, (2) total return equity swaps, (3) forward conversion with options, and (4) forward sale contracts or single-stock futures contracts.
- Most tax regimes respect the legal form of a transaction over economic substance, and therefore, equity monetization techniques, if structured properly, do not typically trigger an immediate taxable event.

- Investors who wish to hedge their concentrated single positions but want to retain some upside potential can consider the use of long puts and cashless collars.
- The economics of a collar can be achieved through a variety of derivative tools, including exchange-traded options, OTC options, forwards, and swaps. Because these tools may be taxed differently, the investor should use the tool that delivers the most tax-efficient result, which often involves avoiding a mismatch in character.
- Business owners may be asset rich but cash poor because many private company owners have most of their personal net worth tied up in their businesses. The owners often want to generate liquidity to diversify into other investments in order to reduce their concentration risk, but there is typically little or no liquidity among the existing shareholder base.
- The common assumption of business and real estate owners that the monetization decision is a “sell or hold” decision and a “once and done” decision is not correct; exit plans can be staged or phased over time to generate liquidity in more than one event.
- Different business monetization strategies often result in different values for the company that is being sold or monetized. Strategic buyers may place higher values on the business compared with financial buyers. Selling to employees is also a possibility, although usually the seller will have to finance a portion of the sale price.
- In business and real estate sale and monetization transactions, the objective should be to maximize the after-tax proceeds that are available to re-invest.
- In a leveraged recapitalization, a business owner partners with a private equity firm and transfers his or her stock for cash and a minority ownership interest in a freshly capitalized entity. The owner monetizes a large portion of his or her business equity (typically 60–80%) and retains significant ownership (20–40%) from that point forward. Because of the retained stake, the owner should remain highly motivated to grow the business.
- Borrowing against appreciated, income-producing real estate, especially on a non-recourse basis, can be an attractive technique to effectively “realize” unrealized real estate gains. In lieu of selling the asset outright to realize the gain and trigger an immediate taxable event, the owner can often borrow against the property to access a large fraction of the proceeds that a sale would have generated but without paying any tax. However, with borrowing, the investor still bears the economic risk of the underlying property.

PRACTICE PROBLEMS

John C. Hill, sole owner of JCH Equipment Leasing Co. (JCH), is evaluating a future sale of his company and approaches Mary Keller, a wealth adviser, for advice. Three discussions from their most recent meeting are shown in Exhibit 1.

Exhibit 1 Selected Discussions from Hill–Keller Meeting

Discussion Number	Speaker	Discussion
1	Hill:	I would like to sell JCH in three to five years and use the proceeds to fund my retirement. Up to this point, I have reinvested the majority of the profits back into the business and have not accumulated any meaningful wealth outside the business.
	Keller:	The first thing we need to consider is the cyclical nature of the equipment leasing industry. Although the economy is expanding today, the stage of the business cycle three years from now is uncertain.
2	Hill:	I have several good employees, but I make all of the strategic operating decisions for the company. I take great pride in the stellar reputation of the company and have been reluctant to cede any meaningful control. I have started the process of looking for a person to assist with the day-to-day operations of the company.
	Keller:	Because you are the sole owner and chief operator of the business, you are exposed to the consequences of a negative corporate event that may result in essentially permanent losses in wealth.
3	Hill:	I believe the operating enterprise is worth \$45 million. There is a good chance that a large acquirer would not want the real estate associated with it.
	Keller:	I am concerned about the rural location, size, tailored nature of the structure, and the old fuel tanks located behind the warehouse.

- For each discussion, **identify** what type of investment risk is being discussed by Hill and Keller. **Justify** each choice. *Answer Question 1 in the Template provided below.*

Template for Question 1

Discussion	Investment Risk (circle one)	Justification
1	systematic	
	non-systematic	
2	systematic	
	non-systematic	
3	systematic	
	non-systematic	

The following information relates to Questions 2–11

Hill refers his friend, Richard Morrison, the former CEO of Masury Bridge and Iron (MBI), to Keller to discuss his wealth goals. Keller meets with Morrison and gathers the following information:

- Richard Morrison is 50 years old and his spouse, Meredith, is 49 years old. Both are healthy and both expect to live at least an additional 40 years.
- The Morrisons have a 20-year-old son and would like to transfer 5% of their wealth to him during their lifetime.
- Richard Morrison retired two years ago and intends to spend his time serving on philanthropic boards; Meredith does not work.
- The Morrisons own 2 million shares of MBI, currently valued at \$50 million, representing approximately 90% of their wealth.
- MBI is a large, publicly traded company, and the Morrisons' position equals approximately 1% of the total market capitalization.
- The Morrison family depends on dividends from MBI for their day-to-day living expenses.
- The cost basis of their MBI shares is close to zero, and the capital gains tax rate is 15%.

- Richard Morrison is loyal to MBI, follows the stock closely, believes he knows the company better than other investors, and expects the company to continue to be a good investment in the future just like it has been in the past.
 - The Morrisons' *key objective* is to maintain their current standard of living during retirement.
- 2 **Identify** and **describe** *three* primary objectives Keller would typically discuss with clients in the Morrisons' position.
 - 3 **State** and **discuss** *two* constraints on the Morrisons' ability to achieve their primary objectives using an outright sale of MBI shares.
 - 4 **Explain** *three* emotional biases that may affect Richard Morrison's decision making.

Keller realizes that the Morrisons' decision making is influenced by psychological considerations and decides to use a goal-based planning approach. Keller constructs Exhibit 2 to simplify the discussion at their next scheduled meeting.

Exhibit 2 Morrison Family Wealth Distribution

Personal Risk Bucket	Market Risk Bucket	Aspirational Risk Bucket
3% of Assets	7% of Assets	90% of Assets
Home: \$1,110,061	Equities: \$1,850,505	MBI Stock: \$50,000,000
Cash/Short-term	Fixed Income: \$1,800,404	
Investments: \$556,606	Commodity: \$237,980	
Total: \$1,666,667	Total: \$3,888,889	Total: \$50,000,000

- 5 **Describe** Keller's use of goal-based planning to highlight the consequences of the Morrisons' selecting an asset allocation that is too risky.
- 6 **Determine** if the current wealth distribution is consistent with the Morrisons' stated key objective. **Justify** your response.

Keller tells the Morrisons:

"Diversification is a bedrock investment principle, and there are several tools that can be used to mitigate the risk of a concentrated single stock position."

- 7 **Identify** and **describe** *three* tools Keller is referring to in the above statement.

Keller and Richard Morrison discuss several hedging techniques and Morrison makes the following statement:

"I like the strategy that allows me to lock-in a floor price and retain unlimited upside potential."

- 8 **Identify** and **discuss** the hedging tool that Morrison is *most likely* referring to in the above statement.
- 9 **Explain** *one* drawback of this hedging strategy.

Keller also discusses a yield enhancement strategy and asks Morrison to establish a liquidation value at which he would be willing to sell 10% of his position in MBI.

10 State and discuss the tool Keller is *most likely* recommending to Morrison.

11 Explain *two* drawbacks to this strategy.

Keller and John C. Hill, the sole owner of JCH Equipment Leasing Co. (JCH), meet to further consider alternate strategies to achieve his objectives of selling JCH, diversifying his single asset concentration, minimizing taxes, and retiring within a 3–5 year time period. Hill believes that tax rates are likely to increase in the near future. In the course of a discussion with Hill, Keller recommends that Hill meet with a reputable “middle market” private equity firm to discuss a leveraged recapitalization strategy.

12 Describe a leveraged recapitalization strategy and **determine** if this strategy will accomplish Hill’s objectives.

13 Explain *two* disadvantages to this exit plan.

SOLUTIONS

1

Template for Question 1

Discussion	Investment Risk (circle one)	Justification
1	systematic	Discussion 1 best describes systematic risk. Systematic risk is the component of risk that cannot be eliminated by holding a well-diversified portfolio. Systematic risk includes macroeconomic factors such as unexpected changes in the level of real business activity and unexpected changes in the inflation rate. Given the cyclical nature of the equipment leasing business and 3 to 5 year target horizon to sell the company, Hill's concentrated position in JCH is exposed to systematic risk.
	non-systematic	
2	systematic	Discussion 2 best describes non-systematic risk, or company-specific risk. This type of risk is specific to a particular company's operations, reputation, and business environment. Hill is the sole owner and chief operator of JCH (key person); therefore, his concentrated position exposes him to a decline in value of the company should he become unable to run the day-to-day operations. Such a negative corporate event may result in essentially permanent losses in wealth.
	non-systematic	
3	systematic	Discussion 3 best describes non-systematic risk, or property-specific risk. It is the risk that the value of a particular property might fall in value because of an event that could affect that property, but not the broader real estate market.
	non-systematic	

- 2 The typical objectives Keller would discuss include reducing the risk of wealth concentration, generating liquidity to diversify and satisfy spending needs, and achieving the prior objectives in a tax-efficient manner.
- 3 Two constraints that may inhibit the Morrisons from achieving their primary objective are the tax consequences of a sale and the attachment of Mr. Morrison to his company as an investment. With a cost basis of nearly zero, an outright sale in the current year would result in the Morrisons incurring a capital gains tax of approximately \$7.5 million.
- 4 A number of emotional biases can negatively affect the decision-making of holders of concentrated positions. Specifically, Richard Morrison's decision to diversify may be negatively affected by loyalty effects, overconfidence/familiarity, and status quo/naïve extrapolation of past returns. The facts indicate that Mr. Morrison is extremely loyal to MBI (loyalty effect); he believes he knows

the company better than other investors (overconfidence/familiarity); and he expects the company to continue to be a good investment as it has been in the past (status quo/naïve extrapolation of past returns).

- 5 Goal-based planning allows the adviser to incorporate psychological considerations into the asset allocation and portfolio construction process. This approach highlights the consequences of selecting an asset allocation that is riskier than is appropriate for a particular investor. A goals-based methodology extends the Markowitz framework of diversifying market risk by incorporating several notional “risk buckets.” The first bucket is the *personal risk bucket*, which includes assets such as a personal residence, certificates of deposit, treasury securities, and other safe investments. The goal of this bucket is protection from poverty or a decrease in lifestyle. The second bucket is the *market risk bucket*, which includes assets such as stocks and bonds. The goal of this bucket is to maintain the current standard of living. The third bucket is the *aspirational risk bucket* and includes assets such as a privately owned business, commercial and investment real estate, and concentrated stock positions. The goal of this bucket is the opportunity to increase wealth substantially. This type of risk allocation framework would give Keller a basis to sit down with the Morrisons and identify the significant risk they face from their concentrated position and highlight that their allocations to the personal risk and market risk buckets are inadequate.
- 6 The Morrisons’ current distribution of wealth is inconsistent with their stated objective of maintaining their current standard of living. The Morrison family portfolio has 90% of their wealth allocated to MBI stock, which falls into the high risk/high return aspirational risk bucket, and only 10% allocated to the personal risk and market risk buckets. A significantly greater allocation to the personal risk and market risk buckets combined with diversification of the single asset concentration (MBI) would be consistent with the stated goal of maintaining their current standard of living into retirement.
- 7 The three tools for addressing a concentrated position in a publicly traded common stock include outright sale, monetization, and hedging. With an outright sale, owners can sell the concentrated position, which gives them funds to meet a spending need or reinvest. An outright sale typically results in significant tax liabilities. Monetization strategies provide the owners with funds to spend or reinvest without triggering a taxable event. A loan against the value of a concentrated position is an example of a monetization strategy. The owner of a concentrated position can hedge the value of the concentrated position with derivatives. A long put position is an example of a hedge.
- 8 The hedging tool Morrison is most likely describing is a protective put position. The strategy is the combination of a long stock position and a long put position, which would provide downside protection (lock in a floor price) with unlimited upside participation. Morrison would buy put options equivalent to the number of shares to be hedged. The put options would have a strike price that is either at or, more typically, slightly below the current stock price. Morrison would pay an amount, referred to as the option premium, to acquire the puts. Conceptually, this is similar to the payment of an insurance premium. If the price of MBI falls below the strike price during the term of the option, the put option could be exercised at the strike price, providing downside protection. If the share price is above the strike price at maturity, Morrison would let the option expire and retain the upside.

A zero-premium collar would not accomplish Morrison’s goal to lock in a floor price and retain unlimited upside potential. A cashless collar is established by buying puts and selling calls on the shares to be hedged. The long put protects

the owner of the shares from any loss below the strike price of the puts. However, the investor forfeits some of the upside potential of the underlying stock. Like a cashless collar, a prepaid variable forward (PVF) would not accomplish Morrison's goal. A PVF combines the economics of a collar and borrowing against the underlying stock within a single instrument.

- 9 There are two potential drawbacks with this hedging strategy. The strategy requires an out-of-pocket expenditure to purchase the put options, which can be significant depending on a number of factors, including the volatility of the stock, the strike price, and maturity. Another potential drawback is the credit risk of the counterparty. Counterparty risk is greater for an over-the-counter (OTC) derivative because the investor incurs the credit risk of a single counterparty. With respect to exchange-traded instruments, because a clearinghouse is the counterparty and guarantees the instrument, the investor incurs significantly less counterparty risk.
- 10 Keller is most likely recommending writing covered calls against 10% of Morrison's shares in MBI. Morrison would sell call options with a strike price that is above the current price of MBI and in return receive premium income (yield enhancement) from the sale of the call options. The strategy effectively allows the investor to establish a *liquidation value* (the strike price) for the shares he/she writes call options against. If the stock price increases above the strike price at maturity, the calls will be exercised and Morrison will deliver his long shares. He would receive a total sum equal to the strike price of the calls and the premium from the initial sale of the calls. If MBI closes at or below the strike price at expiration, the calls will expire worthless and Morrison will retain the option premium and the long shares. One of the most significant benefits of implementing a covered call writing program is that it can psychologically prepare the owner to dispose of his/her shares.
- 11 There are two potential drawbacks with this strategy: The investor retains full downside exposure to the shares (to the extent the share price decreases by more than the premium received), and the upside potential is limited (the call strike price plus the premium received).
- 12 A leveraged recapitalization is a strategy that involves retooling a company's balance sheet in partnership with a private equity firm. A recapitalization strategy is a "staged" exit strategy, which allows the owner to have two liquidity events, one up-front and a second typically within a 3 to 5 year timeframe, when the private equity firm cashes out of the investment. The private equity firm generally invests equity capital and arranges debt with senior or subordinated lenders. The owner transfers his/her stock for cash and an ownership interest in the newly capitalized entity. This allows the owner to monetize a significant portion of his/her business equity (typically 60% to 80%) and retain significant upside potential with the remaining ownership (typically 20% to 40%). The after-tax proceeds the investor receives could be deployed into other asset classes to help build a diversified portfolio. Additionally, the retained stake motivates the owner to grow the business.

From a tax perspective, the owner is taxed currently on the cash received and typically receives a tax deferral on the stock rolled over into the new entity. This strategy would be appealing to a business owner considering selling a private business in the near future and residing in a jurisdiction where tax rates are scheduled to increase.

A leveraged recapitalization strategy appears to be appropriate to meet Hill's objectives. The strategy would allow Hill to reduce the risk of his wealth concentration, generate liquidity to diversify his single asset concentration, minimize his tax liability before tax rates increase, and retire in a 3–5 year time period.

- 13** There are two potential disadvantages to employing a leveraged recapitalization strategy. Private equity firms are financial buyers and, as such, they typically will not pay as high a price as strategic buyers because they do not have the same opportunity as strategic buyers to take advantage of financial and operating synergies. A second potential disadvantage is that the owner relinquishes control of the company.

READING

32

Risk Management for Individuals

by David M. Blanchett, PhD, CFP, CFA, David M. Cordell, PhD, CFP, CFA, Michael S. Finke, PhD, and Thomas M. Idzorek, CFA

David M. Blanchett, PhD, CFP, CFA, is at Morningstar Investment Management LLC (USA). David M. Cordell, PhD, CFP, CFA, is at the University of Texas at Dallas (USA). Michael S. Finke, PhD, is at The American College (USA). Thomas M. Idzorek, CFA, is at Morningstar (USA).

LEARNING OUTCOMES

Mastery	The candidate should be able to:
<input type="checkbox"/>	a. compare the characteristics of human capital and financial capital as components of an individual's total wealth;
<input type="checkbox"/>	b. discuss the relationships among human capital, financial capital, and economic net worth;
<input type="checkbox"/>	c. discuss the financial stages of life for an individual;
<input type="checkbox"/>	d. describe an economic (holistic) balance sheet;
<input type="checkbox"/>	e. discuss risks (earnings, premature death, longevity, property, liability, and health risks) in relation to human and financial capital;
<input type="checkbox"/>	f. describe types of insurance relevant to personal financial planning;
<input type="checkbox"/>	g. describe the basic elements of a life insurance policy and how insurers price a life insurance policy;
<input type="checkbox"/>	h. discuss the use of annuities in personal financial planning;
<input type="checkbox"/>	i. discuss the relative advantages and disadvantages of fixed and variable annuities;
<input type="checkbox"/>	j. analyze and critique an insurance program;
<input type="checkbox"/>	k. discuss how asset allocation policy may be influenced by the risk characteristics of human capital;
<input type="checkbox"/>	l. recommend and justify appropriate strategies for asset allocation and risk reduction when given an investor profile of key inputs.

1

INTRODUCTION

Risk management for individuals is a key element of life-cycle finance, which recognizes that as investors age, the fundamental nature of their total wealth evolves, as do the risks that they face. **Life-cycle finance** is concerned with helping investors achieve their goals, including an adequate retirement income, by taking a holistic view of the individual's financial situation as he or she moves through life. Individuals are exposed to a range of risks over their lives: They may become disabled, suffer a prolonged illness, die prematurely, or outlive their resources. In addition, from an investment perspective, the assets of individuals could decline in value or provide an inadequate return in relation to financial needs and aspirations. All of these risks have two things in common: They are typically random, and they can result in financial hardship without an appropriate risk management strategy. Risk management for individuals is distinct from risk management for corporations given the distinctive characteristics of households, which include the finite and unknown lifespan of individuals, the frequent preference for stable spending among individuals, and the desire to pass on wealth to heirs (i.e., through bequests). To protect against unexpected financial hardships, risks must be identified, market and non-market solutions considered, and a plan developed and implemented. A well-constructed plan for risk management will involve the selection of financial products and investment strategies that fit an individual's financial goals and mitigate the risk of shortfalls.

In this reading, we provide an overview of the potential risks to an individual or household, an analysis of products and strategies that can protect against some of these risks, and a discussion regarding the selection of an appropriate product or strategy. Following the introduction, Section 2 provides an overview of human and financial capital. Section 3 addresses the process of risk management, the financial stages of life for an individual, the economic (or holistic) balance sheet, and individual risks and risk exposures. Section 4 discusses the types of products relevant to financial planning, including insurance and annuities. Section 5 contains an insurance program case study and insights on implementing risk management solutions for individuals. Section 6 summarizes the key points of the reading.

2

HUMAN CAPITAL AND FINANCIAL CAPITAL

To better understand the financial health of an individual—and how to manage the risks faced by that individual—we can use an **economic balance sheet** (or **holistic balance sheet**). We discuss the economic balance sheet in more detail later in the reading, but it is important to note here that an individual's assets are made up of two primary components, **human capital** and **financial capital**, which present unique risk management challenges.

Ibbotson, Milevsky, Chen, and Zhu (2007) define human capital as the net present value of an investor's future expected labor income weighted by the probability of surviving to each future age. Financial capital includes the tangible and intangible assets (outside of human capital) owned by an individual or household. For example, a

home, a car, stocks and bonds, a vested¹ retirement portfolio, and money in the bank are all examples of an individual's financial capital (or financial assets). In this section, both human capital and financial capital are explored in greater detail.

2.1 Human Capital

Advances in human capital theory have revolutionized how economists view the household risk management process. Conceptually, future wages or earnings can be thought of as analogous (in a rough sense) to future interest or dividend payments that flow from an individual's work-related skills, knowledge, experience, and other productive attributes that can be converted into wage income—or human capital. Because human capital provides a significant stream of income over decades, its present value is a significant part of most working households' total wealth portfolio. In fact, human capital is often the dominant asset on a household's economic balance sheet. From a risk management perspective, it is critical to understand the approximate total monetary value of an individual's human capital, the investment characteristics of the individual's human capital (i.e., whether the capital is more stock-like or bond-like), and how the approximate value of an individual's human capital relates to the value of the individual's financial capital. Here, we focus on estimating the approximate monetary value of an individual's human capital.

Given that future earnings for many workers are relatively stable over time, earnings can often be compared with the income one might receive from a bond. This analogy is useful because, similar to the way a financial analyst estimates the present value of a bond by discounting future cash flows, we can estimate human capital by discounting the expected future cash flows generated from wages or other income sources. Conceptually, individuals rent out or lease their human capital in the marketplace in exchange for an ongoing income that is a function of the state of the labor market. Some professions will receive a higher rental value (wage rate or salary) than others. Similarly, some professions will see their rental value fluctuate more with changes in the labor market environment.

Estimating the value of human capital is a complex process because the true value cannot be known. One simple approach is to use a discount rate that reflects the risk associated with the future cash flows (i.e., wages). Government employment and teaching are examples of professions that generally lead to relatively stable growth of future cash flows; in these cases, the human capital value would be estimated using a lower discount rate (to reflect the higher degree of certainty). Conversely, investment banking and racecar driving are examples of professions that may experience unstable and less secure future cash flows, so the value of human capital of investment bankers and racecar drivers would be based on a higher discount rate (to reflect the additional risk associated with their professions).

Equation 1 can be used to estimate the value of an individual's human capital today, at Time 0 (HC_0), where w_t is the income from employment in year t , r is the appropriate discount rate, and N is the length of working life in years. Working life

¹ Vesting refers to ownership of retirement or pension benefits. Once benefits are vested, they belong to the beneficiary. Benefits that are not fully vested can be forfeited or reduced if the individual does not meet future conditions (e.g., if the individual terminates employment before the required number of years of service to the organization).

typically ends at retirement, although it could also be based on the number of years an individual can potentially work (e.g., a 70-year-old may be retired but still have some remaining human capital that could be traded for income in the labor market):

$$HC_0 = \sum_{t=1}^N \frac{w_t}{(1+r)^t} \quad (1)$$

This simple model in Equation 1 can be expanded using Equation 2, where we define the wage in time period t as a product of the wage in period $t-1$ and the sum $(1+g_t)$. That is, the wage in a given period is equal to the previous year's wage increased by g percent (the annual wage growth rate, in nominal terms). We can also modify the discount rate to be the sum of the nominal risk-free rate r_f and a risk adjustment y based on occupational income volatility. Similar to our example earlier contrasting the overall stability of labor income for government workers and teachers to that of investment bankers and racecar drivers, this adjustment recognizes the fact that the income from different professions can vary significantly. The risk adjustment should consider the inherent stability of the income stream as well as the possibility that the income stream will be interrupted by job loss, disability, or death that may be completely unrelated to the type of employment. Additionally, we incorporate mortality, where $p(s_t)$ is the probability of surviving to a given year (or age). Equation 1 uses a simplifying assumption that $p(s_t) = 1$ for each year until retirement (i.e., the individual will survive to retirement with certainty). Using these additional factors, Equation 2 can be restated as:

$$HC_0 = \sum_{t=1}^N \frac{p(s_t)w_{t-1}(1+g_t)}{(1+r_f+y)^t} \quad (2)$$

EXAMPLE 1

Estimating Human Capital

Identify the key assumptions required to estimate an individual's human capital.

Solution:

Human capital can be calculated by using the following formula:

$$HC_0 = \sum_{t=1}^N \frac{p(s_t)w_{t-1}(1+g_t)}{(1+r_f+y)^t}$$

where

$p(s_t)$ = the probability of surviving to year (or age) t

w_t = the income from employment in period t

g_t = the annual wage growth rate

r_f = the nominal risk-free rate

y = risk premium associated with occupational income volatility

N = the length of working life in years

Estimating the Present Value of Human Capital

Using Equation 2, we briefly demonstrate how to estimate the present value of an individual's human capital. John Adam is 60 years old and plans on retiring in 5 years. Adam's annual wage is currently \$50,000 and is expected to grow 2% per year. The risk-free rate is 4%. Adam works in a job with a moderate degree of occupational risk; therefore, we assume a risk adjustment based on occupational income volatility of 3%. There is a 99% probability that Adam survives the first year, a 98% probability that he survives the second year, and probabilities of 98%, 97%, and 96% for the following years, respectively. Given this information and using Equation 2, what is the present value of Adam's human capital?

Risk-free rate	= 4%
Income volatility adjustment	= 3%
Total discount rate	= 7%

Year	Wages (2% annual growth)	Present Value of Wages ^a	Probability of Survival	Probability Weighted Wages ^b
1	\$51,000	\$47,664	99%	\$47,187
2	\$52,020	\$45,436	98%	\$44,527
3	\$53,060	\$43,313	98%	\$42,447
4	\$54,122	\$41,289	97%	\$40,050
5	\$55,204	\$39,360	96%	\$37,786
Total value of human capital				\$211,997

^a This column illustrates "Wages" discounted by 7% as indicated by the discount rate shown. For example: $\$47,664 = \$51,000/1.07$; $\$45,436 = \$52,020/1.07^2$; and so on.

^b The calculation for this column is as follows: $\$47,187 = \$47,664 \times 99\%$. A similar calculation is used for the following years.

How would the estimated value of Adam's human capital change if the wage growth rate were changed to 0%, the risk-free rate decreased to 2%, and the risk adjustment for occupational income volatility also decreased to 2% (using the same base wage and mortality estimates)?

Risk-free rate	= 2%
Income volatility adjustment	= 2%
Total discount rate	= 4%

Year	Wages (No Growth)	Present Value of Wages	Probability of Survival	Probability Weighted Wages
1	\$50,000	\$48,077	99%	\$47,596
2	\$50,000	\$46,228	98%	\$45,303
3	\$50,000	\$44,450	98%	\$43,561
4	\$50,000	\$42,740	97%	\$41,458
5	\$50,000	\$41,096	96%	\$39,453

(continued)

Year	Wages (No Growth)	Present Value of Wages	Probability of Survival	Probability Weighted Wages
Total value of human capital				\$217,371

Reality is typically more complicated than models. Growth rates, nominal risk-free rates, risk adjustments, and mortality are not easily estimated. Additionally, wages do not tend to increase at a constant rate over an individual's lifetime, mortality and disability risk can reduce the value of human capital, and the average growth rate within occupations or even within the overall economy is unknown. In other words, the future payout on human capital, like the future payout on many financial assets, is uncertain. The potential loss of human capital, particularly early in the life cycle, represents an important risk that must be considered. Life and disability insurance, which we discuss later in the reading, are examples of financial instruments that can be used to protect against a random loss in household earnings. As human capital diminishes later in the life cycle, other risks that threaten financial capital and increase spending needs rise in importance. Accordingly, strategies that reduce investment risk and protect against long-term health care expenses and long-life spending needs increase in importance.

Viewing human capital as an asset with its own risk and return characteristics allows us to develop a holistic investment strategy that includes tangible and intangible assets. A total wealth perspective combines human capital with financial capital and incorporates the concept of life-cycle planning (also discussed later) to develop a strategy that maximizes household welfare.

2.2 Financial Capital

Financial capital can be subdivided into various components besides tangible and intangible, such as personal assets and investment assets. Investment assets can be further differentiated into many subtypes with distinctive marketability, tax, and standalone risk characteristics. The relationships between the value of the various components of an individual's financial capital and the value of his or her human capital are important in investment and risk management decision making.

The approach used in financial accounting provides an excellent template for classifying the different financial assets owned by an investor. In financial accounting, the balance sheet includes a summary of all the assets owned by an entity, whether an individual or organization, at a given point in time. Assets are defined broadly as either current or non-current. Current assets are expected to be consumed over the following year; money in a checking account, for example, would be considered a current asset. For an individual, non-current assets—that is, all assets not classified as current assets—include such items as automobiles, real estate, and investments (such as stocks and bonds). Non-current assets differ for a company because they include such items as property, plant, and equipment, as well as intangible assets, such as goodwill.

The financial accounting approach to segmenting assets has important implications when assessing an individual's financial capital because different assets have different roles and each may be exposed to various types of risk. Broadly speaking, an individual's assets can be described as “personal” assets or “investment” assets; personal assets are consumed whereas investment assets are held for their potential to increase in

value and fund future consumption. Some assets, such as real estate, can act as both a personal asset (shelter, as an alternative to renting) and an investment asset (to help fund retirement) for an individual.

EXAMPLE 2

Comparing Financial and Human Capital

Describe human capital and financial capital.

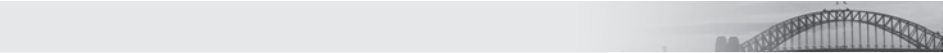
Solution:

Human capital is commonly defined as the mortality-weighted net present value of an individual's future expected labor income. Financial capital includes the tangible and intangible assets (outside of human capital) owned by an individual or household. For example, a home, a car, stocks, bonds, a vested retirement portfolio, and money in the bank are all examples of an individual's financial capital (or financial assets).

2.2.1 Personal Assets

Personal assets are assets an individual consumes (or uses) in some form in the course of his or her life. Such assets may include automobiles, clothes, furniture, and even a personal residence. In many cases, personal assets are not expected to appreciate in value, and they are often worth more to the individual than their current fair market value.

As mentioned earlier, some assets, like real estate, could be considered a “mixed” asset with both personal and investment characteristics. Another potential example of a mixed asset is collectibles (such as jewelry, wine, stamps, and artwork), which will be discussed separately in a later section. Mixed assets can be especially desirable because they enable individuals to derive satisfaction (i.e., utility) from their current value as well as having the potential to increase in value over time.



Classifying Private Accrued Defined Benefits and Government Retirement Benefits

When separating an individual's total wealth into human capital and financial capital, accrued defined benefits from private pension and government retirement plans—such as the Canada Pension Plan and Old Age Security Pension, the Age Pension in Australia, the mandatory state pension in Germany, and Social Security in the United States—can potentially be classified as either human capital or financial capital. Some practitioners note that accrued defined benefits and government pension benefits are typically a form of deferred labor income, and thus, they prefer to classify these benefits as human capital. Others find it more intuitive to think of accrued defined benefits and social security as a form of human capital that has been converted into a financial asset. In this reading, we classify accrued defined benefits and government pension benefits as components of financial capital.

2.2.2 *Investment Assets*

Investment assets are the components of an individual's wealth that are often the easiest to identify and typically receive the majority of the attention from financial planners and investment professionals. Investment assets extend beyond relatively tangible investment assets (such as a liquid portfolio) to include less tangible assets (such as an accrued defined benefit pension).

One criterion for subdividing investment assets is marketability, which describes how easy it is to trade an asset. We subdivide marketable assets into publicly traded and non-publicly traded segments, and we define non-marketable assets as those without any ready market (e.g., human capital).

Traditional portfolio construction generally focuses entirely on publicly traded marketable assets, like stocks and bonds, with optimization determining the weights allocated to marketable assets. This approach often ignores the existence of marketable assets that are not publicly traded as well as other non-marketable assets "owned" by the individual (e.g., human capital). In reality, each asset has important risk characteristics that should be considered. In the absence of a generalized framework that can estimate the risk and return of all of the components of an individual's total wealth and their correlations, one must understand the inherent risk and return characteristics of the non-marketable assets and make informed judgments when constructing a holistic portfolio. We will explore this concept more fully later in the reading.

2.2.3 *Publicly Traded Marketable Assets*

Traditional balance sheets tend to emphasize publicly traded marketable assets because their value and risk characteristics are generally easier to estimate than those of non-publicly traded assets. Publicly traded marketable assets include money market instruments, bonds, and common and preferred equity.

2.2.4 *Non-Publicly Traded Marketable Assets*

Non-publicly traded marketable assets include real estate, some types of annuities, cash-value life insurance, business assets, and collectibles.

2.2.4.1 Real Estate Real estate—or direct real estate, as it is sometimes called to distinguish it from real estate investment trusts (REITs)—is typically among the largest assets owned by an individual. In many countries, home ownership is common, although the level of home ownership varies materially by country. For example, in Germany, approximately half of households own a home, whereas in China, the number is closer to 90%. To purchase a home, many individuals obtain a mortgage loan. It is common for the home buyer to contribute some percentage of the home's value (e.g., 20%) as a down payment to mitigate some of the risk to the lender. The term of the mortgage loan can vary (e.g., 15 years, 30 years), as can the mortgage's interest rate (which can be either fixed or floating). Mortgage payments are often the largest fixed obligation of homeowners, especially during the early years of a mortgage loan. Mortgages present a unique risk for homeowners because they create a leveraged exposure in a home. For example, a 20% down payment (80% mortgage loan) implies that for any given change in the value of the home, the change in the equity (value less the mortgage loan) of the home will be five times greater than the change in the value of the home. Mortgage loans are either recourse or non-recourse, and the status varies by region. With recourse mortgages, if the borrower defaults on the mortgage, the lender has the right to recover from the borrower any amount due on the loan, whereas non-recourse loans prevent the lender from recovering any further amount from the borrower. Non-recourse loans are thus riskier for lenders because the only available collateral for the loan is the home. As a result, non-recourse loans generally have higher interest rates and/or higher borrower credit standards than recourse loans.

2.2.4.2 Annuities Annuities are effectively a private defined benefit pension for which an insurance company has guaranteed, or will guarantee, income for life or over some fixed period for the beneficiary (called the annuitant). The estimated balance sheet value of an annuity is comparable to that of a defined benefit pension with a discount for potential insolvency risk, which is difficult to eliminate through diversification or a market hedge. Annuities will be discussed in more detail later in the reading.

2.2.4.3 Cash-Value Life Insurance A variety of types of life insurance are available, including cash-value life insurance, for which the policy not only provides protection upon a death but also contains some type of cash reserve. This form of insurance usually combines life insurance protection with some type of cash accumulation vehicle. Some insurance policies allow the purchaser to invest in relatively aggressive investments, such as equities, although more conservative investments, such as bonds, are generally more common. Life insurance products will also be discussed at greater length later in the reading.

2.2.4.4 Business Assets Business assets can represent a significant portion of the total wealth of an individual, especially a self-employed individual. A variety of unique considerations are involved in investing for business owners because their total capital may be very closely tied to the overall performance of the business (i.e., if the business does poorly, it affects not only the value of the business, but also the owner's earnings as well). The value of business assets may best be estimated through recent sales of comparable private businesses within the same industry—often as a multiple of net income or net income with various adjustments (e.g., EBITDA). The value of business assets may vary based on market conditions and will often correlate with other financial assets within a household portfolio. This potential correlation is an important consideration in the risk management process for individuals, particularly small business owners.

2.2.4.5 Collectibles Collectibles include such items as stamps, paintings, wine, and precious metals (e.g., coins). The value of these assets is often set by auction markets or specialized dealers and involves substantial transaction costs. Collectibles may also provide a flow of utility for the owner. For example, in addition to benefiting from the potential price increase of a painting, the owner is able to display the painting in his or her home and view it daily.

2.2.5 Non-Marketable Assets

The most significant non-marketable financial assets are pensions, whether from a private employer or from a governmental organization. In this section, we consider both types of pensions.

2.2.5.1 Employer Pension Plans (Vested) There are a variety of retirement plan types across the globe. These accounts can generally be described as either employee-directed savings plans, in which contribution amounts and investments are controlled by the individual (and not guaranteed), or traditional pension plans, which guarantee some level of retirement benefits, typically based on past wages. We include only vested pension benefits as financial assets, because unvested pension benefits are typically contingent on future work and are thus considered to be part of human capital.

The value of a vested traditional defined benefit pension from an employer can be estimated by determining the mortality-weighted net present value of future benefits. The mortality-weighted net present value at Time 0 (now), $mNPV_0$, can be estimated using Equation 3, which is reasonably equivalent to Equation 1. Equation 3 is based on the future expected vested benefit (b_t), the probability of surviving until year t [$p(s_t)$],

and a discount rate (r). The discount rate should vary based on the relative riskiness of the future expected benefit payment—that is, the rate will be higher for riskier future benefit payments—and should reflect whether the benefit is in nominal or real terms:

$$mNPV_0 = \sum_{t=1}^N \frac{p(s_t)b_t}{(1+r)^t} \quad (3)$$

Estimating an appropriate discount rate to use in valuing a pension can be quite complex, although it is generally less complex than estimating the discount rate to use in valuing an individual's human capital. There are a number of factors to consider in determining the pension discount rate. As a starting point, one should consider the health of the plan (e.g., its funding status, where the value of the plan's liability is estimated using an appropriate market-based discount rate), the credit quality of the sponsoring company, and any additional credit support. If the company in question has long-term bonds, the yield on the bonds can provide a proxy for an appropriate discount rate. As one example of credit support, the Pension Protection Fund (PPF) was established in the United Kingdom as part of the Pensions Act 2004 to guarantee continued payment of most UK defined benefit pension plans should the employer become insolvent. The existence of PPF insurance helps to decrease the payout risk (and accompanying discount rate) for eligible UK pension plans.

2.2.5.2 Government Pensions Government pensions are similar to employer pension plans but are generally more secure (in those countries with a high degree of credit-worthiness). As with employer pension plans, the vested or accrued benefit amount can be estimated by calculating the mortality-weighted net present value. Given the guaranteed nature of these benefits, government pensions can be considered relatively bond-like. For example, in the United States, retiree government pension benefits (called Social Security retirement benefits) can be thought of as a government bond with benefits indexed to inflation (because Social Security retirement benefits usually increase annually based on inflation). This inflation adjustment is consistent with securities called Treasury Inflation-Protected Securities (TIPS).

Regardless of the domicile, one should consider the financial health of the government entity sponsoring the defined benefit plan as well as the legal framework and any accompanying political risk at the country level.

2.2.6 Account Type

Financial capital is often held in account types that have different tax attributes. Although these account types (and the potential tax benefits surrounding them) vary materially by country, the accounts can generally be described as taxable, tax-deferred, or non-taxable. A taxable account is one for which taxes are due annually on the realized gains, dividends, and/or interest income. A tax-deferred account is one for which taxes on any gains are deferred until some future date, such as when a withdrawal is made from the account. A non-taxable account is one for which taxes are never due, no matter how much the account grows.

2.3 Economic Net Worth

An individual's *net worth* consists of the difference between traditional assets and liabilities that are reasonably simple to measure, such as investment assets, real estate, and mortgages. **Economic net worth**, however, extends net worth to include claims to future assets that can be used for consumption, such as human capital and the present value of pension benefits. When we refer to economic net worth in this reading, we refer to the more holistic accounting of resources that can be used to fund future consumption for the purpose of financial planning over the life cycle.

A FRAMEWORK FOR INDIVIDUAL RISK MANAGEMENT

3

This section contains an overview of the important considerations when developing an effective risk management plan for an individual. First, a risk management strategy for individuals is introduced. Next, the primary financial stages of the life of an individual are discussed. We then incorporate the human capital and financial capital concepts developed in Section 2 into an individual's economic (or holistic) balance sheet, explaining how key components of that balance sheet develop over time. Finally, we identify some of the primary risks to an individual and how they evolve during an individual's lifetime.

3.1 The Risk Management Strategy for Individuals

In general, *risk management* for individuals is the process of identifying threats to the value of household assets and developing an appropriate strategy for dealing with these risks. The risk management strategy provides a framework that allows a household to decide when to avoid, reduce, transfer, or self-insure those risks. There are typically four key steps in the risk management process:

- 1 Specify the objective.
- 2 Identify risks.
- 3 Evaluate risks and select appropriate methods to manage the risks.
- 4 Monitor outcomes and risk exposures and make appropriate adjustments in methods.

3.1.1 Specify the Objective

The overarching objective of individual risk management is to maximize household welfare through an appropriate balance of risk and safety. Risk represents a possible decrease in future spending caused by unexpected events, such as a market crash, a physical disability, the premature death of a primary earner, or health care expenses. As with investments, this objective is achieved by deciding how much risk a household is willing to bear in order to achieve its long-run spending goals.

3.1.2 Identify Risks

Households face a significant number of risks, including earnings, premature death, longevity, property, liability, and health risks. These risks will be discussed at length in subsequent sections. Each of these risks is associated with a potential loss of financial and/or human capital, and individuals should address each of them to determine how best to address the possibility of loss.

3.1.3 Evaluate Risks and Select Appropriate Methods to Manage the Risks

The existence of a risk exposure does not necessarily require the purchase of an insurance product. The appropriate risk management strategy considers the magnitude of the risk and the range of options available to address that risk. Section 5.1 will explain the choice among the four techniques of risk avoidance, risk reduction, risk transfer, and risk retention. *Risk avoidance* involves avoiding a risk altogether. For example, one way to avoid the risk to human and financial capital from riding a motorcycle is to simply not own or ride one. *Risk reduction* involves mitigating a risk by reducing its impact on an individual's welfare, either by lowering the likelihood that it will occur or by decreasing the magnitude of loss (for example, by wearing a helmet when riding a motorcycle). *Risk transfer* involves transferring the risk: The use of insurance and annuities to transfer risk to insurers will be discussed later in

the reading. *Risk retention* involves retaining a risk and thus maintaining the ability to finance the cost of losses; when funds are set aside to meet potential losses, the individual is said to *self-insure*.

3.1.4 Monitor Outcomes and Risk Exposures and Make Appropriate Adjustments in Methods

Once the appropriate risk management method has been selected, risks must be monitored and updated as the household moves through its life cycle. It is advisable to annually review an insurance/risk management program, including all the ongoing risk exposures and risk management methods. As an individual's goals and personal and financial situation change, these changes will affect risk exposures and optimal risk management strategies. In addition to an annual review, every life change—such as a birth, marriage, inheritance, job change, relocation, divorce, or death—should trigger a review of the risk management plan.

3.2 Financial Stages of Life

Individuals tend to follow a predictable pattern during their lifetimes: They invest in education early in life, embark on a career, start families, accumulate assets, fund growing household expenses, transition into retirement, and ultimately pass on wealth through bequests. In each of these life-cycle stages, the household faces unique goals and risks that require appropriate investment and risk management strategies.

Defining financial stages of life in clear and concise terms does pose a challenge because all individuals are different; however, financial stages are a useful construct when thinking about risk management and the optimal forms of insurance and other products to consider at different ages. Therefore, we divide the financial stages of life for adults into the following seven periods:

- Education phase
- Early career
- Career development
- Peak accumulation
- Pre-retirement
- Early retirement
- Late retirement

3.2.1 Education Phase

The education phase occurs while an individual is investing in knowledge (or human capital) through either formal education or skill development. In theory, the education phase could begin as early as when an individual starts primary school, but this phase typically involves the period when the individual starts developing more specific human capital by attending college or trade school or undertaking an apprenticeship. In some cases, an individual in the education phase may be largely financially dependent on his or her parents or guardians and have little, if any, accumulated financial capital. There is generally little focus on savings or risk management at this point; however, some individuals in this phase may already have families and could benefit from products, such as life insurance, that hedge against the risk of losing human capital.

3.2.2 Early Career

The early career phase normally begins when an individual has completed his or her education and enters the workforce. This stage may begin as early as age 18 (16 in some countries) or as late as the late 20s (or even early 30s), depending on the level

of education attained, and generally lasts into the mid-30s. During this period, the individual often marries, perhaps has young children, may purchase a home, and usually begins to save for their children's college expenses. Sometimes, a career-related relocation occurs that could have negative short-term financial implications. Significant family and housing expenses may not allow for much retirement savings. Insurance may be especially valuable during this phase because human capital represents such a large proportion of total wealth and family members are highly dependent on the human capital of one or two individuals to fund expected future consumption.

3.2.3 Career Development

The career development phase normally occurs during the 35–50 age range and is often a time of specific skill development within a given field, upward career mobility, and income growth. This phase often includes accumulation for the children's college educations as well as expenditures for college. Concern intensifies about retirement income planning and financial independence. Higher earners will begin building wealth beyond education and retirement objectives and may make large purchases, such as a vacation home, or travel extensively. Retirement saving tends to increase at a more rapid pace during this phase compared with the early career phase.

3.2.4 Peak Accumulation

In the peak accumulation phase, generally during the ages of 51–60, most people either have reached or are moving toward maximum earnings and have the greatest opportunity for wealth accumulation. This phase may include accumulating funds for other goals and objectives, but it is usually a continuation of retirement income planning, coordination of employee benefits with investment and retirement strategies, and travel. Investors following a life-cycle portfolio strategy will begin to reduce investment risk to emphasize income production for retirement (particularly near the end of this period) and become increasingly concerned about minimizing taxes, given higher levels of wealth and income. There is also potentially more career risk in this phase because if an individual were to lose his or her job, it might be relatively difficult for that individual to find another job with similar pay.

3.2.5 Pre-retirement

The pre-retirement phase consists of the few years preceding the planned retirement age, and it typically represents an individual's maximum career income. Many people in this phase continue to restructure their portfolios to reduce risk and may consider investments that are less volatile. There is further emphasis on tax planning, including the ramifications of retirement plan distribution options.

3.2.6 Early Retirement

The early retirement phase in the cycle is generally defined as the first 10 years of retirement and, for successful investors, often represents a period of comfortable income and sufficient assets to meet expenses. For individuals who are forced to retire because of injury or unemployment, this time may be one of shifting expectations and may involve changing to a lifestyle more commensurate with the individual's savings. This is generally the most active period of retirement and is when an individual is less likely to suffer from cognitive or mobility limitations. The primary objective of the retiree is to use resources to produce activities that provide enjoyment. Some retirees seek a new career, and many will look for a job (part time or full time) that has less stress. It is important to note that upon entering retirement, the need for asset growth does not disappear. For many households, the length of retirement could exceed two decades; given this potential horizon, it is important to continue taking an appropriate level of investment risk in retirees' portfolios.

3.2.7 Late Retirement

The late retirement phase is especially unpredictable because the exact length of retirement is unknown. This uncertainty about longevity for a specific individual is known as longevity risk, which is the risk that retirement could be very short or very long. Physical activity typically declines during this phase, as does mobility. Although many individuals live comfortably and are in good health until their final days, others experience a long series of physical problems that can deplete financial asset reserves. Cognitive decline can present a risk of financial mistakes, which may be hedged through the participation of a trusted financial adviser or through the use of annuities. Annuities will be discussed in more detail later in the reading.

Two additional concerns may be appropriate to any financial stage. First, depending on the family situation, the need to provide for long-term health care may become apparent. Second, some people may need to devote resources to care for parents or a disabled child for an extended period of time.

EXAMPLE 3

Financial Stages of Life

From a personal financial planning standpoint, what are typical characteristics of someone in the “peak accumulation” phase?

Solution:

An individual in the peak accumulation phase of the life cycle would typically have the following characteristics:

- Approximate age of 51–60
- Maximum earnings and opportunity for wealth accumulation
- Increased interest in retirement income planning
- Greater emphasis on stability and less emphasis on growth in the investment portfolio
- Greater concern about tax strategies
- Increased concern about losing employment because it may be more difficult to find new employment

3.3 The Individual Balance Sheet

A traditional balance sheet includes assets and liabilities that are usually easy to quantify. Our purpose in developing an individual balance sheet is to more comprehensively represent the assets available to fund life-cycle consumption and for wealth preservation and transfer bequests. The primary value of a balance sheet in this context is to illustrate the magnitude of risk exposures for an individual. This perspective is particularly important for individuals who are in life-cycle stages during which human capital is a significant share of overall wealth and for individuals who hold claims on pension assets that grow in value later in the life cycle.

In this section, we attempt to provide a more complete picture of an investor’s wealth through the use of an economic balance sheet (or holistic balance sheet), which we initially mentioned in Section 2. Such a balance sheet provides a useful overview of the individual’s total wealth portfolio, supplementing traditional balance sheet assets with human capital and pension wealth and expanding liabilities to include consumption and bequest goals. These additional liabilities are important because they often represent leverage created in order to gain access to assets, such as the cost of

education to create human capital. They also represent regular payment obligations that may influence the optimal amount of portfolio liquidity and investment risk. Human capital and pension wealth are important because they represent expected income flows that can be drawn on to fund future consumption.

3.3.1 Traditional Balance Sheet

The simplest balance sheet for an individual investor includes recognizable marketable assets and liabilities. Assets include any type of investment portfolio, retirement portfolio (or plan), real estate, and other tangible and intangible items of value. Liabilities include mortgage debt, credit card debt, auto loans, business debt, and student loans. An example of a simple balance sheet (or statement of net worth) is shown in Exhibit 1, where the assets are netted against the liabilities to determine the net worth of the individual.

Exhibit 1 Traditional Balance Sheet as of 31 December 2014

Assets		Liabilities	
Liquid Assets		Short-Term Liabilities	
Checking account	€35,000	Credit card debt	€25,000
Certificates of deposit	€100,000	Total short-term liabilities	€25,000
Total liquid assets	€135,000		
Investment Assets		Long-Term Liabilities	
Taxable account	€750,000	Car loan*	€25,000
Retirement plan	€600,000	Home mortgage	€500,000
Cash value of life insurance	€25,000	Home equity loan	€90,000
Total investment assets	€1,375,000	Total long-term liabilities	€615,000
Personal Property			
House	€2,200,000		
Cars	€160,000		
House contents	€150,000		
Total personal property	€2,510,000		
Total Assets	€4,020,000	Total Liabilities	€640,000
		Net Worth	€3,380,000

* Note: A portion of the car loan would likely be short term, but to simplify, we included the entire loan as a long-term liability.

The net value of an asset, or its equity, is calculated by subtracting liabilities associated with that asset from the gross value. For example, an individual may own a home worth £1 million, but if that individual has a £900,000 mortgage, the equity in the home would be only £100,000 (ignoring any additional intangible benefits associated with home ownership).

It should be noted that this traditional balance sheet includes those assets that can be valued easily but ignores other individual assets that are material, such as human capital and pension benefits. For individuals in the earlier life-cycle stages, human

capital is larger than other assets on the balance sheet. For those who are eligible to receive a guaranteed retirement income stream, the present value of these assets is significant and can be of great value to older individuals. Although non-marketable and difficult to value precisely, human capital and retirement benefits are extremely important when planning the optimal use of assets and the repayment of liabilities over a life cycle.

3.3.2 Economic (Holistic) Balance Sheet

The primary goal of an economic (holistic) balance sheet is to arrive at an accurate depiction of an individual's overall financial health by accounting for the present value of all available marketable and non-marketable assets as well as all liabilities. This view allows an individual to map out the optimal level of future consumption and non-consumption goals (such as bequests or other transfers) given the resources that exist today and those that are expected in the future. Although a traditional balance sheet provides information about marketable assets that exist today, it offers limited insight into how these assets should be used to maximize the expected lifetime satisfaction of the individual (a concept economists call "utility"). An economic balance sheet allows an individual to anticipate how available resources can be used to fund consumption over the remaining lifetime.

Exhibit 2 provides a simplified example of an economic balance sheet, which is an expanded version of the traditional balance sheet in Exhibit 1. The traditional assets and liabilities are condensed from the traditional balance sheet in Exhibit 1, with the present value of human capital and pensions added as assets and the present value of lifetime consumption and bequests added as liabilities. For further simplification purposes, we assume that all the assets and liabilities in Exhibit 1 are already calculated at their present value.

Exhibit 2 Economic (Holistic) Balance Sheet as of 31 December 2014

Assets		Liabilities	
Financial capital	€4,020,000	Debts	€640,000
Liquid assets		Credit card debt	
Investment assets		Car loan	
Personal property		Home mortgage	
		Home equity loan	
Human capital	€1,400,000	Lifetime consumption needs (present value)	€4,200,000
Pension value	€500,000		
		Bequests	€400,000
Total Assets	€5,920,000	Total Liabilities	€5,240,000
		Economic Net Worth	€680,000

An economic balance sheet that includes the present value of non-marketable assets (e.g., human capital and pensions) and liabilities (e.g., consumption needs and bequests) provides a much more accurate baseline from which to maximize the expected utility of future consumption. Assessing pension and human capital value

can also be useful when setting consumption or bequest goals because these assessments provide a more accurate estimation of the future trade-offs an individual will make. Younger households with greater human capital, in addition to spending more to protect the value of this human capital early in the life cycle, will be able to plan for more generous retirement savings goals than households with comparatively lower human capital.

The total economic wealth of an individual changes throughout his or her lifetime, as do the underlying assets that make up that wealth. The total economic wealth of younger individuals is typically dominated by the value of their human capital because younger individuals have not had as much time to save and accumulate financial wealth. As individuals grow older, they are likely to save some of their earnings and will accumulate financial capital. The total value of human capital and the total value of financial capital tend to be inversely related over time as individuals attempt to smooth consumption through borrowing, saving, and eventual spending. When human capital is depleted, an absence of financial capital would result in no wealth to fund an individual's consumption needs. Although some people may live with family or friends at older ages out of necessity, most would prefer to have financial independence in retirement—something that typically requires individuals to save throughout their prime working years.

Although the economic net worth in the hypothetical economic balance sheet was equal to €680,000, it is possible for an individual to have either a surplus or a shortfall. For example, if the individual is not saving enough to adequately fund the lifestyle he or she will want at retirement, that individual may have a shortfall. Alternatively, if the individual is saving more than enough to fund lifestyle needs and has no bequest goals, he or she may have a surplus. In either case, an economic balance sheet provides some perspective about the overall financial situation of an individual based on his or her holistic wealth.

EXAMPLE 4

Traditional vs. Economic Balance Sheet

Contrast a traditional balance sheet with an economic balance sheet.

Solution:

A traditional balance sheet includes assets and liabilities that are generally relatively easy to quantify. An economic balance sheet provides a useful overview of one's total wealth portfolio by supplementing traditional balance sheet assets with human capital and pension wealth and including additional liabilities, such as consumption and bequest goals.

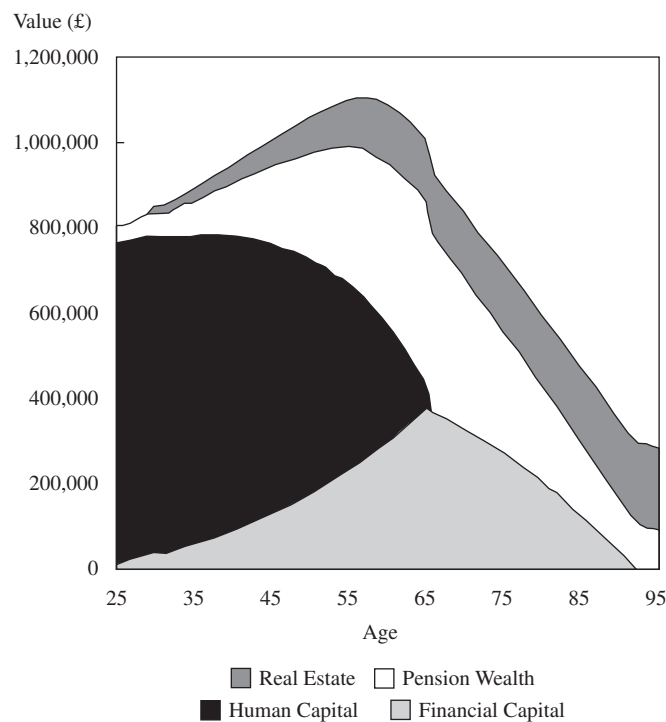
3.3.3 Changes in Economic Net Worth

To provide some context for how the relative value of various household assets changes over a lifetime, we will use the hypothetical example of a British individual at age 25. This 25-year-old is assumed to make £40,000 a year in after-tax income. Over his or her lifetime, real wages are expected to grow at a constant rate of 1% per year, the annual savings rate is 10%, the nominal discount rate is 8%, and the rate of expected inflation is 3%. The value of human capital is estimated using Equation 2. Financial capital at age 25 is assumed to be £10,000, and it is expected to grow at an annual real rate of return of 3% per year. The assumed need from the portfolio is £20,000 for the first year of retirement (age 65) and is increased annually by inflation throughout retirement.

We further assume that at age 30 the individual purchases a home that costs £100,000 in today's currency. The home is purchased with a 10% down payment (which comes from financial capital), with the remainder financed by a 30-year mortgage at a fixed nominal interest rate of 5%. The real growth rate of the value of the home is assumed to be 1%. Total pension benefits of £20,000 per year (in today's currency, at age 25) are assumed to commence at age 65, and the real discount rate for pension retirement benefits is 5%. We assume the benefits are accrued throughout the employment of the individual.

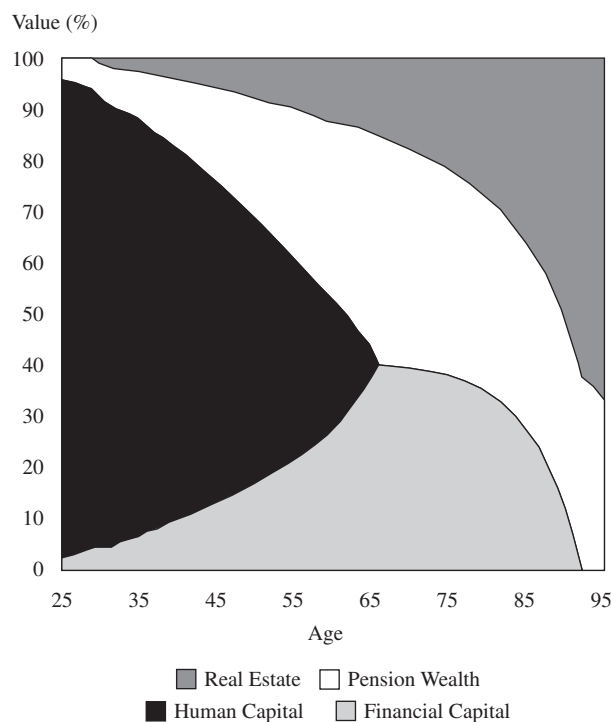
Exhibit 3 shows the values of the assets in the individual's economic balance sheet and how they are expected to change over time. To simplify the concept, we demonstrate graphically how the sample inputs reflect the allocation in the exhibit.

Exhibit 3 Life-Cycle Economic Balance Sheet Allocation



Traditional balance sheet assets, such as investments in marketable securities, real estate, and businesses, vary in importance from one life-cycle stage to the next. In general, tangible assets, such as real estate and personal goods, which provide great value to a young family, dominate a household's portfolio early in the life cycle. As households age, they accumulate financial assets that must be managed efficiently to provide the greatest expected later-life consumption for the amount of risk the household is willing to take. Non-traditional balance sheet assets, such as employer pensions, increase in importance later in the life cycle, providing an important source of stable consumption and affecting the optimal allocation of securities within an investment portfolio. To illustrate, Exhibit 4 provides the relative weights for the various assets included in Exhibit 3.

Exhibit 4 Relative Weights of Economic Balance Sheet Allocation



In Exhibit 4, we see that for the typical individual, an investment portfolio represents a significant portion of wealth at age 65 but is still less than 50% of the total economic wealth when home equity, pension wealth, and human capital are also considered. As that individual proceeds through his or her retirement years and funds consumption, the relative share of the investment portfolio declines. In the early retirement stage, total economic wealth is dominated by pension wealth (i.e., the remaining mortality-weighted net present value of benefits) and the value of real estate (i.e., the individual's personal residence). For wealthier individuals, the value of defined benefit pension wealth will likely represent a low percentage of the total wealth portfolio in retirement. To the extent that defined benefit pension wealth has very low credit risk (for example, because of the low default probability of National Insurance in the United Kingdom), a retiree's optimal investment portfolio allocation will be affected. As discussed earlier, one must consider the financial health of both the plan and the sponsor providing the defined benefit pension.

In a related manner, a 65-year-old with £2 million in pension wealth will have a higher level of expected remaining lifetime consumption than a retiree with £1 million in pension wealth and the same traditional balance sheet net worth. Both individuals will need to consider means to safeguard the value of the pension wealth as part of the financial planning process. For example, a pension from a private employer may be subject to company-specific risk. The risk of employer insolvency might be hedged in financial markets by positions in securities and derivatives (if available) that have a negative correlation with the value of the company. As mentioned previously, guarantees of benefit payments may exist, such as the Pension Protection Fund in the United Kingdom that protects many private defined benefit schemes.

The allocation of the different asset types will affect the optimal financial asset allocation decision. A 45-year-old individual in Germany with €1 million in human capital and €500,000 in investment assets should invest differently than a 45-year-old with €3 million in human capital and an identical €500,000 in investment assets. The

volatility in the investment portfolio of the individual with lower human capital will have a much greater impact on variation in expected consumption if both individuals have a 40-year planning horizon. Assume that the first 45-year-old with €1.5 million in combined human and financial capital expects to spend approximately €38,000 each year until age 85. The other 45-year-old with €3.5 million in economic net worth expects to spend €88,000 each year. All else being equal, a 40% loss in the first individual's portfolio ($0.4 \times €500,000 = €200,000$) will lead to a 13.2% loss in expected spending per year $[(€200,000/40 \text{ years})/€38,000]$ whereas a 40% investment loss to the second individual's portfolio will lead only to a 5.7% decrease in expected consumption $[(€200,000/40 \text{ years})/€88,000]$. For this reason, portfolio recommendations will be less conservative for the investor with high human capital than for the investor with low human capital if both have the same level of risk tolerance.

EXAMPLE 5

Changes in Human and Financial Capital

Describe how the relative values of human capital and financial capital change over an individual's lifetime.

Solution:

The total value of human capital and the total value of financial capital tend to be inversely related over time as individuals attempt to smooth consumption through borrowing, saving, and eventual spending. When human capital becomes depleted, without financial capital, an individual will have no wealth to fund his or her lifestyle. Human capital is generally largest for a younger individual, whereas financial capital is generally largest when an individual first retires.

3.4 Individual Risk Exposures

Managing risks to financial and human capital is an essential part of the household financial planning process. In this section, we provide an overview of the risks faced by individuals and discuss how they relate to human and financial capital. In future sections, we introduce financial products that could be used to manage many of these risks.

3.4.1 Earnings Risk

Earnings risk, within the context of personal risk management, refers to the risks associated with the earning potential of an individual—that is, events that could negatively affect the individual's human and financial capital. As noted previously, health issues can affect earnings, and some health risks are a function of the occupation itself. For example, a construction worker is likely to face higher health-related earnings risk than the average worker. Aside from health issues, unemployment and underemployment represent major factors in earnings risk. Sometimes, an employee's job performance or a poor "fit" may lead to job loss, but many people find themselves without a job through no fault of their own.

The risk associated with unemployment for reasons other than disability is rather difficult to characterize. In some cases, such as government employees and union members with seniority, the likelihood of unemployment may be very low. Smaller, younger companies may be riskier employers because of dynamic business conditions or cash flow issues. But even large, well-established companies have been known to go out of business or to close unprofitable divisions or locations. In such cases, even an offer to transfer to another location may be undesirable for someone late in his

or her working life, for someone with a working spouse and/or children in school, or for someone who strongly prefers to remain in the same location for a variety of other reasons. Some industries are cyclical and are prone to layoffs, whereas other industries are subject to competitive pressures that may lead to permanent terminations. Self-employed individuals and even some professionals are prone to variability in their earnings. Of course, the cost is the loss or reduction of earnings and may also include the loss of employer contributions to one's retirement fund as well as other benefit programs. A lengthy period of unemployment may itself create more risk because employers are sometimes hesitant to hire people who have been out of work for an extended period of time. If the individual finally finds a job, it may be at a dramatically lower compensation level.

Obviously, the loss of income represents a reduction in both human and financial capital, and this reduction is exacerbated if job opportunities are few, especially in a poor economy or in a region or industry that is particularly affected. For individuals who lose a job as they approach retirement age, it could be very difficult to find another job, even if there are regulations against age discrimination. Aside from the stress on the family budget, unemployment can be psychologically devastating to the individual and his or her family. With earnings risk, as well as health risk (which is discussed in further detail later), an implication in estimating the total value of human capital is that individuals who work in dangerous occupations or in jobs that have a high likelihood of variability or disruption in earnings have either lower future expected earnings or a higher discount rate or both. Financial capital may also be affected by earnings risk because assets will be needed to make up for any loss of income. Furthermore, there may be a need to seek additional training or education to acquire requisite skills, and this retooling can be very expensive.

3.4.2 *Premature Death Risk*

The term **premature death risk**, which is sometimes referred to as mortality risk, relates to the death of an individual earlier than anticipated whose future earnings, or human capital, were expected to help pay for financial needs and aspirations of the individual's family. These needs include funding day-to-day living expenses, such as food, housing, and transportation, as well as paying off debts, saving for a child's education, and providing for a comfortable retirement for the surviving spouse. An individual's death may also lead to a reduction in the income of the surviving spouse because some family responsibilities of the deceased individual must now be performed by the surviving spouse (assuming the spouse does not remarry). For a young family, the effect can be especially tragic because the increase in household lifestyle that might have accompanied the career of the deceased may never occur (again, if there is no remarriage).

A risk to consumption needs also occurs if a non-earning member of the family dies. The loss can be estimated as the discounted value of the services provided by the deceased family member plus any out-of-pocket death expenses. If a household's primary caregiver dies, the rest of the family can help with that member's responsibilities, but often additional, paid help is required to replace the primary caregiver's duties. This scenario will mean a dramatic change in lifestyle, compounding the incalculable emotional effect of the death. It could even have a negative impact on the career of the surviving spouse, who may feel drained by the added responsibilities.

Besides the obvious reduction in human capital that the death of an income earner represents, there are also effects on financial capital. Death expenses (including funeral and burial), transition expenses, estate settlement expenses, and the possible need for training or education for the surviving spouse are among the financial costs that may be incurred.

3.4.3 Longevity Risk

Longevity risk within the context of financial planning relates to the uncertainty surrounding how long retirement will last and specifically the risks associated with living to an advanced age in retirement (e.g., age 100). An extended retirement period may deplete the retiree's resources to the point at which income and financial assets are insufficient to meet post-retirement consumption needs. A common question posed to financial planners is, "How much money do I need to have when I retire?" The answer is dependent on the lifespan of the individual, and longevity is a key variable that can only, at best, be estimated. Other important variables include the nominal rate of return on the portfolio, the rate of inflation, additional sources of income (and whether those sources are adjusted for inflation), and the level of spending. Determining how large a fund an individual will actually have at retirement depends on the amount and timing of contributions, the nominal rate of return, and the amount of time until retirement.

When calculating the sum needed at retirement, financial planners often run a Monte Carlo simulation that is based on an assumed asset allocation to calculate the probability that the funds will last for a specified number of years. Another approach for the time variable is to use a mortality table, adjust for health factors, and add years to be conservative. For example, Friedrich is retiring at age 65, and the mortality tables in his country indicate that a 65-year-old man has an expected lifespan of 20 years. But Friedrich is healthy, exercises regularly, eats well, and has had annual physical examinations, and his parents lived until their late 80s, which was past life expectancy at that time. Friedrich might assume that his retirement will last only 20 years (his life expectancy), but the mortality tables indicate a 50% chance that he will live beyond the forecasted period, which is why it is common to add years to be conservative (e.g., plan for retirement to last 30 years, or until age 95). The decision regarding the additional number of years is obviously subjective. The only way to minimize the likelihood of living beyond the forecasted retirement period would be to use extremely advanced ages (e.g., age 110).

Longevity risk can have a significant impact on the lifestyle of an individual. Even in countries that provide significant pension benefits, income may be inadequate to support the hoped-for lifestyle, and insufficient assets may exacerbate the situation. Making matters worse, many pension programs do not consider inflation. Furthermore, some pension programs, even those sponsored by governmental entities, are unlikely to have sufficient assets to pay future expected liabilities without significant changes to the pension structure. Relying on a pension thus entails its own set of risks.

Longevity risk affects human capital in the sense that an individual who is concerned about "living too long" may choose to work longer than someone else might. Indeed, all else being equal, the person who is concerned about outliving his or her money and who intends to work longer has more human capital, but at the possible expense of a less desirable (i.e., longer) retirement stage.

3.4.4 Property Risk

Property risk relates to the possibility that a person's property may be damaged, destroyed, stolen, or lost. There are, of course, many different possible events relating to property risk. A house may catch fire, an automobile may be involved in a collision or be damaged in a hailstorm, or a valuable necklace may be lost. In the context of property risk, *direct loss* refers to the monetary value of the loss associated with the property itself. For example, a house fire may cause €50,000 of damage. If the repair process requires that the family live elsewhere while the damage is repaired, the expenses incurred are considered an *indirect loss*. If the family is renting a room to a boarder, the income lost during construction would also be considered an indirect

loss. Similarly, if a driver damages his or her automobile by running into a curb, the damage to the automobile is a direct loss and the cost of renting a replacement automobile is an indirect loss.

Because property represents a financial asset, property risk is normally considered to be associated with a potential loss of financial capital. But property used in a business to create income is rightfully considered in a discussion of human capital. That is, this type of business property can be considered a tool that helps drive future earnings, and to the extent that such property is at risk, human capital is also at risk. Business owners should be especially conscious of the fact that in the absence of insurance or other risk management techniques, both financial and human capital is at risk.

3.4.5 Liability Risk

Liability risk refers to the possibility that an individual or household may be held legally liable for the financial costs associated with property damage or physical injury. In general, one may be *liable* if because of one's action—or inaction when one is legally responsible for taking action—bodily injury, property damage, or other loss is incurred by another person or entity.

For individuals, the most common cause of legal liability involves driving an automobile. An automobile accident may cause bodily injury leading to medical costs, lost income, and even the necessity for long-term care. For the vast majority of people, the potential liability of a major automobile accident exceeds not only their financial capital but also their human capital as well. For example, in some jurisdictions, a liability judgment may result in the confiscation (often termed garnishing) of the wages or other income of the person found liable. Note, though, that the person who is found liable—for example, in an automobile accident—may also have suffered an injury that may affect the individual's financial and/or human capital.

As an example of liability risk, assume that a driver causes an automobile accident in which a passenger in the other car is injured and the other driver's automobile is heavily damaged. In many jurisdictions, the individual who caused the accident is deemed responsible for the repair or replacement of the damaged automobile and the medical expenses and lost income of the victim. As another example, in many countries, a homeowner or even an apartment renter may be deemed legally liable for an accident that causes injury or property damage to a visitor. For example, a guest may accidentally slip on some steps, be seriously injured by the fall, and become incapable of gainful employment. Even if the visitor was careless, laws may specify that the owner or renter of the property is liable.

3.4.6 Health Risk

Health risk refers to the risks and implications associated with illness or injury. Direct costs associated with illness or injury may include coinsurance, copayments, and deductibles associated with diagnostics, treatments, and procedures. In the context of health insurance, the term *coinsurance* means that the insured must share some of the costs of the specific health care provided. For example, an insurance company may be obligated to pay 80% of the cost of a medical procedure and require that the insured pay the other 20%. *Copayments* refer to the requirement that the insured pay a specified amount of money for a medical service, typically treatment by a physician. For example, a copayment, or “copay,” of US\$30 may be required for a visit to a primary care physician and US\$45 may be required for a visit to a specialist. The remainder of the actual expense is paid by the insurance company. A *deductible* is an amount that the insured is required to spend on health care approved by the insurance company during the plan year before the insurance company pays for anything. For example, there may be a US\$500 deductible per person and a US\$1,500 total deductible for

a family. Insurance companies contend that coinsurance, copayments, and deductibles discourage frivolous use of the health care system, thereby keeping insurance premiums lower.

In some countries, health care costs for individuals can be significant. Obviously, the risk associated with these costs varies considerably both across and within countries and must be considered as a risk to financial capital. Health factors typically have a significant impact on the premiums individuals pay for life, disability, and long-term care insurance.

Health risks manifest themselves in different ways over the life cycle and can have significant implications for human capital as well as for financial capital. For example, if a worker becomes disabled as a result of an accident or health incident, he or she may be unable to work while health expenses are incurred, resulting in a loss to both current assets and future earnings. The impact of a negative health event on human capital can be approximated by using the discounted cash flow framework and estimating the decline in projected cash flows along with an increase in the discount rate arising from increased earnings uncertainty. Illness and injury can also obviously have an adverse impact on life expectancy, potentially resulting in death before planned retirement. Furthermore, health issues involving non-earning members of the family can also be costly. There may be a need for special medical services, housing improvements, specialized vehicles, and other health-related expenses. In the case of the special needs of a child, the financial obligation could continue well beyond the parents' working lives, or even their actual lives.

Although long-term care is a part of the national health care system in some countries, such as Germany and Japan, in others, such as the United States, the cost of long-term care can represent a significant burden on financial capital. In countries where long-term care expenses are incurred by the individual, policies that provide insurance to protect against the cost of long-term care should be considered. Long-term care insurance is designed to cover a portion of the cost of necessities, such as home care, assisted living facilities, and nursing homes.

The risk and cost of long-term care may be considered both a health issue and an issue of insufficient assets at an advanced age—the latter being a component of the aforementioned longevity risk. The risks may also go beyond the immediate family unit. For example, one may have a parent who is not financially capable of paying for long-term care. An added risk is that inflation in long-term care costs (i.e., medical costs) has historically been higher than base inflation.

EXAMPLE 6

Individual Risk Exposures (1)

Describe premature death risk with respect to financial and human capital.

Solution:

Within a personal financial planning context, premature death means that an individual dies before fully providing for his or her financial needs (and, if applicable, those of the family). By definition, at that point human capital is eliminated because the deceased individual can no longer generate income. To a lesser degree, there may also be an impact on financial capital. In addition to expenses associated with a funeral and burial, there may be a need for significant transitional funds or even a requirement to settle certain debts or business obligations upon the individual's death. Funds may also be required for education and/or training of the surviving spouse to generate income.

EXAMPLE 7

Individual Risk Exposures (2)

Describe longevity risk within the context of personal financial planning, and explain how it relates to human and financial capital.

Solution:

Longevity risk refers to the possibility that an individual may live long enough to deplete his or her resources—to outlive one's money. Longevity risk relates primarily to financial capital—that is, spending one's retirement portfolio. But there is also an aspect of human capital in that one may address longevity risk, in part, by retiring later, thus expanding one's retirement portfolio and reducing the number of years to draw it down while increasing one's human capital.

INSURANCE AND ANNUITIES

4

An individual's balance sheet provides a comprehensive overview of the asset categories held to fund current and future spending. Each of these categories involves some risk of a random loss. Managing these risks involves assessing possible loss exposures and considering market and non-market solutions to both address the possibility of and reduce the magnitude of a loss. We review the range of products that can be used to reduce these risks and present a strategy for analyzing the value of possible treatment options.

What are the consequences of risk? Effective risk management for individuals addresses the trade-offs between expected total wealth and security. Individual life-cycle planning involves assessing expected available resources and planning an optimal earning and spending path over a lifetime. But life does not always unfold as expected. A negative event can threaten the value of assets, and a loss in this value will cause total wealth (and expected future consumption) to fall. For each risk exposure, a solution exists to reduce that risk, whether through an altered portfolio allocation, a change in behavior, or the purchase of financial and/or insurance products. Each of these solutions involves a cost that generally results in a lower expected level of consumption over time. Shifting assets from risky to risk-free securities results in the loss of a risk premium. In the case of financial products, purchasing insurance trades a reduction in expected lifetime consumption for an increase in the stability of expected spending after a loss. In this section, we discuss the various types of insurance that individuals may use in financial planning. We then turn our attention to annuities, another financial product available to individuals.

4.1 Life Insurance

Life insurance protects against the loss of human capital for those who depend on an individual's future earnings. In this section, we provide an overview of the key uses of life insurance, the primary types of life insurance, the basic elements of a life insurance policy, how a life insurance policy is priced, and how to determine the appropriate amount of life insurance to purchase, if any.

4.1.1 Uses of Life Insurance

Life insurance provides a hedge against the risk of the premature death of an earner. A family's need for life insurance is related to the risk of the loss of the future earning power of an individual less the expected future spending of that individual. In each case, the risk associated with premature death can be mitigated by transferring the risk to a third party (i.e., by purchasing life insurance). The optimal amount of insurance to purchase is a function of both the expenses of the insurance hedge and the magnitude of the difference in expected lifetime utility with and without that family member.

Life insurance can also be an important estate-planning tool. A life insurance policy can provide immediate liquidity to a beneficiary without the delay involved in the legal process of settling an estate (i.e., distributing assets to beneficiaries) following the death of an individual. This liquidity can be particularly valuable if the estate contains illiquid assets or assets that are difficult to separate and distribute equitably among heirs.

Another possible use of life insurance is as a tax-sheltered savings instrument, notably in the United States. As mentioned previously in this reading, cash-value policies invest a portion of the premium in a tax-advantaged account that represents the difference between the current cost of providing insurance coverage and the premium. The mortality charge is the cost of providing life insurance, which increases with age (as does mortality risk). As mortality risk increases, the accumulated excess premium can be used to pay the increasingly higher costs of providing insurance protection. These excess premiums can be invested in a variety of instruments that can grow over time sheltered from taxation and can eventually be cashed out without paying for older-age life insurance protection.

4.1.2 Types of Life Insurance

There are two main types of life insurance: temporary and permanent. For the purposes of this reading, both types of life insurance are assumed to be non-cancelable: The policy lapses only at the end of the term (for temporary life insurance) or upon death (for permanent life insurance).

Temporary life insurance provides insurance for a certain period of time specified at purchase. This type of coverage is commonly referred to as “term” life insurance. If the individual survives until the end of the period (e.g., 20 years), the policy will terminate unless it can be automatically renewed. Generally, premiums for term life insurance either remain level over the insured period (e.g., 20 years) or increase over the period as mortality risk increases. The cost of term insurance is less than that of permanent insurance, and the cost per year is less for shorter insured periods (e.g., 10 years versus 20 years), again because of increasing mortality risk.

Permanent life insurance provides lifetime coverage, assuming the premiums are paid over the entire period. Policy premiums for permanent life insurance are usually fixed, and there is generally some underlying cash value associated with a permanent insurance policy. There are several types of permanent life insurance that vary by region. Here, we will discuss the two most common types of permanent life insurance: *whole life insurance* and *universal life insurance*.

Whole life insurance remains in force for an insured's entire life (hence the name). Whole life insurance generally requires regular, ongoing fixed premiums, which are typically paid annually, although monthly, quarterly, and semiannual payment options also exist. Failure to pay premiums can result in the lapse of the insurance policy. There is generally a cash value associated with a whole life insurance policy that may be accessed if the insured chooses to do so. The non-cancelability of whole life insurance can make this type of policy appealing to purchase at younger ages, when an individual is typically healthier. Whole life insurance policies can be participating or non-participating. Participating life insurance policies allow potential growth at a

higher rate than the guaranteed value, based on the profits of the insurance company. A non-participating policy is one with fixed values: The benefits will not change based on the profits and experience of the insurance company. Universal life insurance is constructed to provide more flexibility than whole life insurance. The policy owner, generally the insured, has the ability to pay higher or lower premium payments and often has more options for investing the cash value. The insurance will stay in force as long as the premiums paid or the cash value is enough to cover the policy expenses of the provider.

Many permanent life insurance policies have a “non-forfeiture clause,” whereby the policy owner has the option to receive some portion of the benefits if premium payments are missed (i.e., before the policy lapses). The scenarios permitted by a non-forfeiture clause generally include a cash surrender option (whereby the existing cash value is paid out), a reduced paid-up option (whereby the cash value is used to purchase a single-premium whole life insurance policy), and an extended term option (whereby the cash value is used to purchase a term insurance policy, generally with the same face value as the previous policy).

In addition, a number of potential “riders” can be added to both temporary and permanent life insurance policies. Riders are modifications that add some risk mitigation beyond the basic policy. One example of a common rider is an “accidental death” rider (also referred to as accidental death and dismemberment, or AD&D), which increases the payout if the insured dies or becomes dismembered from an accident. Other common riders include an accelerated death benefit (which may allow insured parties who have been diagnosed as terminally ill to collect all or part of the death benefit while they are still alive), guaranteed insurability (which allows the owner to purchase more insurance in the future at certain predefined intervals), and a waiver of premium (whereby future premiums are waived if the insured becomes disabled). The value of the rider will depend on the level of protection against an unexpected decline in consumption not otherwise provided by a basic policy. An additional way for life insurance policyholders to access the value of the policy is the option to sell the policy to a third party, which is often called a viatical settlement. After purchasing the policy, the third party becomes responsible for paying the premiums and will receive the death benefit when the insured dies.

4.1.3 Basic Elements of a Life Insurance Policy

The basic elements of a life insurance policy include

- the term and type of the policy (e.g., a 20-year temporary insurance policy),
- the amount of benefits (e.g., £100,000),
- limitations under which the death benefit could be withheld (e.g., if death is by suicide within two years of issuance),
- the contestability period (the period during which the insurance company can investigate and deny claims),
- the identity (name, age, gender) of the insured
- the policy owner,
- the beneficiary or beneficiaries,
- the premium schedule (the amount and frequency of premiums due), and
- modifications to coverage in any riders to the policy.

In addition, for a life insurance policy to be valid, the policy owner generally needs to have an insurable interest in the life of the insured. Thus, the presence of an insurable interest is a basic element of an insurance policy as well.

The insured, the policy owner, the beneficiary (or beneficiaries), and the insurer are the four primary parties involved in any life insurance policy. The insured is the individual whose death triggers the insurance payment. The policy owner is the person who owns the life insurance policy and is responsible for paying premiums. The beneficiary is the individual (or entity) who will receive the proceeds from the life insurance policy when the insured passes away. The actual beneficiary of a jointly owned life insurance policy may be determined by the order of death of the prospective beneficiaries (e.g., a husband and a wife). Lastly, the insurer is the insurance company that writes the policy and is responsible for paying the death benefit. The amount payable to the beneficiary is typically referred to as the “face value” of the life insurance policy.

For most life insurance policies, the policy owner and the insured are the same person. In certain instances, however, a policy owner may choose to obtain insurance to protect against a loss in economic value from the death of another individual. For example, as part of a divorce, one ex-spouse may purchase life insurance on the other ex-spouse. Similarly, a business may purchase life insurance on a key executive under the assumption that the business would be negatively affected by that executive’s death.

When the insured is not the policy owner, the policy owner must have an “insurable interest” in the life of the insured. Insurable interest prevents individuals from gambling on the lives of strangers and removes any incentive to hasten the insured person’s demise. An insurable interest means that the policy owner must derive some type of benefit from the continued survival of the individual that would be negatively affected should that individual pass away. For example, a spouse has an insurable interest because he or she relies on the income or household services of the other spouse. A business has an insurable interest in key executives who are essential to the ongoing operations of the business.

Life insurance benefits are payable to the beneficiary upon the death of the insured. Usually, some form of documentation or proof of death is required by the life insurance company, such as a death certificate, before benefits are paid to the beneficiary. Death benefits from a life insurance policy can be paid in various forms, such as a lump sum or an annuity, although lump sums are generally more common.

There may be certain situations in which a life insurance company would not be required to pay a benefit. For example, if the insured commits suicide within some predetermined period after purchasing the policy (e.g., two years), or if the insured made material misrepresentations relating to his or her health and/or financial condition during the application process, benefits may not be payable. There is often a maximum contestability period during which the insurer has a legal right to contest the death benefit, after which the insurer cannot deny the claim even if it involves suicide and/or material misstatement.

EXAMPLE 8

Elements of a Life Insurance Policy

Describe the concept of insurable interest for life insurance.

Solution:

An insurable interest means that the policy owner must derive some type of benefit from the continued survival of the insured that would be negatively affected should the insured pass away. For example, an individual may rely on a spouse for his or her financial well-being. If the spouse dies, income is no longer generated, leading to financial problems. Another example is a business that may have an insurable interest in a key employee who generates large sales

volumes. The purpose of an insurable interest is to prevent individuals from gambling on the lives of others or from having a financial reason to arrange the death of the insured.

4.1.4 How Life Insurance Is Priced

There are a number of factors that determine how an insurer prices life insurance, and there are many different types of life insurance policies. Although the details of the actuarial calculations are beyond the scope of this reading, it is useful to understand the basic concepts of life insurance pricing.

In general, there are three key considerations in the pricing of life insurance: mortality expectations, a discount rate, and loading.

4.1.4.1 Mortality Expectations One of the most important factors in determining the price for life insurance is the expected mortality of the insured individual (i.e., how long the person is expected to live). Actuaries at insurance companies estimate mortality based on both historical data and future mortality expectations. Generally speaking, life expectancies in most regions of the world have been increasing. Certain attributes, such as age and gender, are obvious factors in evaluating life expectancy. Whether the applicant is a smoker (or has other health risks) is another important factor because smoking is associated with deadly diseases. Exhibit 5 shows an example of the probability of men and women (both smokers and non-smokers) dying at various ages, although these numbers will vary considerably in different countries.

Rather than use a generalized mortality table, life insurance company actuaries typically make adjustments to consider additional factors. The underwriting process serves to categorize applicants according to their perceived riskiness, consistent with the actuaries' specifications. The resulting customized tables consider applicants' health history, particularly conditions that are associated with shorter-than-average life expectancy, such as cancer and heart disease. If an applicant's parents or siblings died at a relatively early age from certain diseases, that applicant may be considered a bigger risk. Excess weight is another health issue leading to shorter life expectancies. Certain activities, such as scuba diving and flying personal aircraft, are deemed to increase mortality risk also. All of these underwriting factors can be collected on a typical life insurance application, and the salesperson who gathers this information can be considered the first level of the underwriting process.

For larger policies, insurance companies may require a physical examination, performed by an insurer-paid nurse or physician, and the examination could include blood pressure, cholesterol and other blood analysis, an electrocardiogram, and other tests. All of these factors can be used to categorize applicants in tables that discriminate among standard risks, preferred (lower) risks, and high risks, and the cost to the insured can vary considerably. Of course, some people have a sufficient number of factors, or serious-enough factors, to make them uninsurable. This underwriting process reduces the likelihood of *adverse selection*. Adverse selection refers to the fact that individuals who know that they have higher-than-average risk are more likely to apply for life insurance. Unless the insurance company performs its underwriting well, mortality experience can be worse than projected.

The Probability of Dying at Certain Ages

Exhibit 5 provides information about the mortality (i.e., the probability of dying) for males and females at different ages.² The cost of life insurance is based on the probability that the insured will die during the duration of the policy. The table helps demonstrate why younger (versus older) individuals, females (versus males), and non-smokers (versus smokers) tend to pay less for life insurance—the expected probability of dying in a given year is lower.

Exhibit 5 Mortality of Males and Females at Certain Ages

Age	Male			Female		
	Composite	Non-Smoker	Smoker	Composite	Non-Smoker	Smoker
35	0.14%	0.09%	0.14%	0.08%	0.07%	0.10%
40	0.21%	0.15%	0.24%	0.12%	0.10%	0.17%
45	0.26%	0.19%	0.35%	0.14%	0.11%	0.23%
50	0.30%	0.23%	0.48%	0.21%	0.15%	0.37%
55	0.42%	0.35%	0.74%	0.32%	0.25%	0.60%
60	0.67%	0.50%	1.21%	0.52%	0.37%	1.00%
65	1.12%	0.84%	2.08%	0.88%	0.59%	1.66%
70	1.81%	1.40%	3.35%	1.48%	0.95%	2.61%
75	3.18%	2.58%	5.34%	2.45%	1.71%	3.93%
80	5.38%	4.65%	7.56%	4.23%	3.33%	6.27%
85	9.71%	8.80%	11.75%	7.77%	6.54%	10.74%
90	17.41%	16.55%	19.04%	13.79%	12.27%	17.34%
95	25.49%	25.16%	26.09%	21.96%	20.82%	24.65%

EXAMPLE 9

Mortality Expectations

If a given male and female are the same age and have equivalent health profiles, evaluate which one should expect to pay more for life insurance.

Solution:

A key pricing component of life insurance is expected mortality. From Exhibit 5, one can see that the chance of death for females across the age spectrum is less than it is for males of the same age. Therefore, all else being equal, females should expect to pay less than males for the equivalent life insurance.

² Data are based on the American Academy of Actuaries' 2017 Commissioners Standard Ordinary (CSO) Tables. <https://www.soa.org/experience-studies/2015/2017-cso-tables/> accessed 21 November 2018

4.1.4.2 Calculation of the Net Premium and Gross Premium The *net premium* of a life insurance policy represents the discounted value of the future death benefit. To illustrate a simplified calculation of the net premium, we will consider the example of a one-year, non-renewable term life insurance policy with a death benefit of US\$100,000 for Ramon, a 40-year-old non-smoking male. The insurance company insures thousands of people with characteristics like Ramon's. Thus, the life insurance company will experience a predictable distribution of death benefit payments in a given year, although it does not know who among its customers will die during that year.

Premiums are collected at the beginning of the year, and for simplicity, we will assume that death benefit payments occur at the end of the year. As shown in Exhibit 5, and in the absence of other underwriting information, Ramon has a probability of 0.15% of dying within the year. Although the life insurance company will pay a death benefit of either US\$100,000 or US\$0, we can calculate an expected outflow at the end of the year of US\$150, which equals $(0.0015 \times \text{US\$}100,000) + (0.9985 \times \text{US\$}0)$. Finally, a discount rate, or interest factor, representing an assumption of the insurance company's return on its portfolio, is applied to the expected outflow. Assuming a 5.5% rate, US\$150 is discounted by one year to a present value of US\$142.18 ($\text{US\$}150/1.055$), which is the net premium.

As mentioned previously, life insurance companies typically offer level term policies, under which the insured can pay equal annual premiums for a specified number of years—for example, a five-year level term policy. The calculation still requires discounting expected future death benefit payments back to the present, but we must also consider the fact that the individuals who die within the five-year period will not be paying premiums for the remaining outstanding term.

To determine what the insurance company would actually charge Ramon for the one-year policy, the insurer must consider other factors to calculate the *gross premium*. The gross premium adds a *load* to the net premium, allowing for expenses and a projected profit for the insurance company.

Expenses are incurred by the insurer for both writing a life insurance policy and managing it on an ongoing basis. Expenses associated with writing a life insurance policy include the costs of the underwriting process, which potentially include a sales commission to the agent who sold the policy and the cost of a physical exam. Ongoing expenses include overhead and administrative expenses associated with monitoring the policy, ensuring that premiums are paid on a timely basis, and verifying a potential death claim. Furthermore, most companies provide a low percentage “renewal commission” for the first years of the policy, which encourages the agent to provide needed advice to the policy owner and to try to keep the policy owner from terminating the policy.

Life insurers can be divided into two groups—stock companies and mutual companies. Stock companies are similar to other corporations in that they are owned by shareholders, have a profit motive, and are expected to provide a return to those shareholders. Within the constraints of supply and demand for their product, stock life insurance companies add a projected profit as a part of the load in pricing their policies. In contrast, mutual companies are owned by the policy owners themselves and there is no profit motive. Mutual companies typically charge a gross premium that is somewhat higher than the net premium plus expenses, even though mutual companies do not have profits per se. Then, if mortality experience, expenses, and/or investment returns are better than projected, the amount by which the gross premium exceeds the net premium plus expenses may be paid back to the policy owners as a policy dividend, which is considered a return of premium to the policy owner rather than income.

Premiums for level term policies are higher than those for annually renewable (one-year) policies in the early years. But premiums are lower in the later years of the policies—most notably for longer periods, such as a 20-year level term—because annually renewable term policies often have rapidly increasing premiums. As can be

seen in Exhibit 5 earlier in this section, mortality rates begin accelerating rather quickly after age 40. Life insurers sometimes offer low initial rates on annually renewable policies with the expectation that many purchasers of these policies will simply pay the increasing premiums.

Some consumers buy an annually renewable term policy with the intention of taking advantage of the “loss-leader” pricing in the early years and then, when rates rise too much, switching to another company that has a lower premium at the newly attained age. Unfortunately, there is risk in this strategy in that a health issue or accident could make that individual uninsurable, leaving him or her with an annually renewable policy that has an escalating premium.

EXAMPLE 10

Life Insurance Pricing

Discuss the three most relevant elements of life insurance pricing.

Solution:

The three most relevant considerations in pricing life insurance are mortality expectations, the discount rate, and loading.

- **Mortality expectations:** The insurer is concerned about the probability that the insured will die within the term of the policy. Actuaries evaluate mortality expectations based on historical experience, considering such factors as age and gender, the longevity of parents, blood pressure, cholesterol, whether the insured is a smoker, and whether the insured has had any diseases or injuries that are likely to lead to death during the policy term.
- **Discount rate:** A discount rate, or interest factor, representing an assumption of the insurance company’s return on its portfolio, is applied to the expected outflow.
- **Loading:** After calculating the net premium for a policy, which may be considered the pure price of the insurance, the insurance company adjusts the premium upward to allow for expenses and profit. This adjustment is the load, and the process is called loading.

4.1.4.3 Cash Values and Policy Reserves As noted earlier, although initial premiums are higher, whole life policies offer the advantage of level premiums and an accumulation of cash value within the policy that (1) can be withdrawn by the policy owner when the policy endows (or matures) or when he or she terminates the policy or (2) can be borrowed as a loan while keeping the policy in force. These cash values build up very slowly in the early years, during which the company is making up for its expenses. For example, just the first-year commission on a whole life policy could be equivalent to 100% of the first-year premium; thus, the company is “in the hole” for the first few years and trying to recover the initial expenses. The commissions decline in subsequent early years as the effort required by a sales agent to service the policy is reduced.

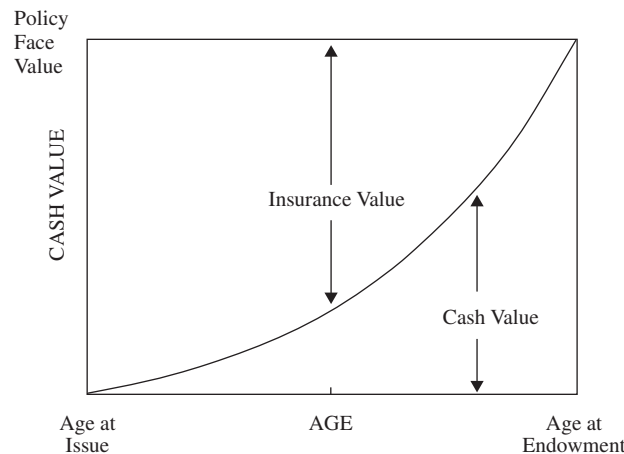
Exhibit 6 shows a representation of the build-up of cash value within a whole life policy that endows at a specified age, perhaps age 100. It is important to recognize the interrelationship of the following amounts:

- The premium stays constant.
- The face value stays constant.

- The cash value increases.
- The insurance value decreases.

Essentially, as cash values increase and the insurance value decreases, the ongoing premium is paying for less and less life insurance.

Exhibit 6 Build-up of Cash Value in a Whole Life Insurance Policy



To the extent that the life insurance is intended to replace human capital, it may become unnecessary after the individual's working years are finished. Enough financial capital may have been accrued to make even the immediate death expenses payable from other funds without the need for life insurance. The existence of increasing cash values within a policy adds another dimension to the decision whether to terminate a policy.

Note also that life insurers are typically required by regulators to maintain *policy reserves*, which are a liability on the insurance company's balance sheet. Policy reserves become especially important for whole life policies. With a whole life policy, the insurance company specifies an age at which the policy's face value will be paid as an endowment to the policy owner if the insured person has not died by that time. The insurance company must accumulate reserves during the life of the policy to be able to make that payment. The policy reserve can be defined as follows: Policy reserve = Present value of future benefits – Present value of future net premiums. From the equation, we can infer that as the insured person gets older, the present value of the future death benefit (or the cash value that could be withdrawn) gets larger. At the same time, the present value of the future net premiums gets smaller because fewer premiums remain. Thus, the policy reserves must grow larger over time until, at the time of endowment, the reserves equal the present value of the future benefits. (See Rejda and McNamara 2014, p. 272.)

4.1.4.4 Consumer Comparisons of Life Insurance Costs It may seem easy to compare the cost of two different policies of equal size by simply looking at the first year's premiums. Although this may be the case with term policies, comparing the cost of two whole life insurance policies is much more complex because, for example, one policy may have larger premiums but also faster growth of cash values.

Consumer and/or governmental organizations may provide comparisons of policies from various life insurance companies based on projected data, including assumptions about future dividends and cash values. In many jurisdictions, regulations require that life insurance companies provide consumers with cost data that consider the

time value of money and assume a specified number of years. The two most popular indexes for comparison are the *net payment cost index* and the *surrender cost index*, both of which calculate a cost per year per thousand dollars of life insurance coverage under different sets of assumptions. Both methods assume a specific time period, such as 20 years, and a specific compounding discount rate, such as 5%.

The net payment cost index assumes that the insured person will die at the end of a specified period, such as 20 years. Calculation of the net payment cost index includes the following steps:

- A** Calculate the future value of an annuity due of an amount equal to the premium, compounded at a 5% discount rate for 20 years. An annuity due—an annuity for which the premium payment is received at the beginning of the period (versus an ordinary annuity, for which the premium payment is received at the end of the period)—is used because premiums are paid at the beginning of the period.
- B** Calculate the future value of an ordinary annuity of an amount equal to the projected annual dividend (if any), compounded at 5% for 20 years. An ordinary annuity is used because dividend payments are made at the end of the period.
- C** Subtract B from A to get the 20-year insurance cost.
- D** Calculate the payments for a 20-year annuity due with a future value equal to C and a discount rate of 5%. This amount is the interest-adjusted cost per year. Again, an annuity due is used because premium payments occur at the beginning of the year.
- E** Divide by the number of thousand dollars of face value.

The surrender cost index assumes that the policy will be surrendered at the end of the period and that the policy owner will receive the projected cash value. Calculation of the surrender cost index includes the following steps:

- A** Calculate the future value of an annuity due of an amount equal to the premium, compounded at 5% for 20 years. We use an annuity due here for the same reason indicated for the net payment cost index.
- B** Calculate the future value of an ordinary annuity of an amount equal to the projected annual dividend (if any), compounded at 5% for 20 years. We use an ordinary annuity here for the same reason indicated for the net payment cost index.
- C** Subtract B and the Year 20 projected cash value from A to get the 20-year insurance cost.
- D** Calculate the payments for a 20-year annuity due with a future value equal to C and a discount rate of 5%. This amount is the interest-adjusted cost per year.
- E** Divide by the number of thousand dollars of face value.

For example, a US\$100,000 face value whole life policy has an annual premium of US\$2,000, paid at the beginning of the year. Policy dividends of US\$500 per year are anticipated, payable at year-end. A cash value of US\$22,500 is projected for the end of Year 20.

Net Payment Cost Index Calculation

Future value of premiums (annuity due): US\$2,000 annual payment, 20 years, 5%	US\$69,439
Future value of dividends (ordinary annuity): US\$500 annual payment, 20 years, 5%	–16,533
	<hr/>

(Continued)

20-year insurance cost	US\$52,906
Annual payments for 20-year insurance cost (annuity due): 20 years, 5%	1,524
Divide by US\$ thousands of face value	÷ 100
Net Payment Cost Index, cost per US\$ thousand per year	US\$15.24

Surrender Cost Index Calculation

Future value of premiums (annuity due): US\$2,000 annual payment, 20 years, 5%	US\$69,439
Future value of dividends (ordinary annuity): US\$500 annual payment, 20 years, 5%	–16,533
20-year cash value (given above)	–22,500
20-year insurance cost	US\$30,406
Annual payments for 20-year insurance cost (annuity due): 20 years, 5%	876
Divide by US\$ thousands of face value	÷ 100
Surrender Cost Index, cost per US\$ thousand per year	US\$8.76

The major benefit of these indexes is the ease of comparing policies of the same type. Generally speaking, the lower the index value is, the better the value. However, policies do not always perform as projected. If the insurance company's actual return, expense, and/or mortality experiences are worse than projected, the *ex post* indexes could be larger.

Calculating Life Insurance Needs

Two distinctly different methods are commonly used to calculate the amount of life insurance needed. The *human life value* method is consistent with the concept of human capital. It involves replacing the estimated net contribution to family finances that the insured would generate if that individual did not die during his or her projected earning life. In general, this calculation involves estimating future income that would be generated by the insured, offset by incremental expenses that would be attributable to the insured. The net amounts in each year are then discounted back to the present to calculate the amount of insurance needed. An amount may be added to cover so-called "final expenses," such as funeral and other death expenses.

The *needs analysis* method, as the name implies, is concerned with meeting the financial needs of the family. Needs analysis typically involves estimating living expenses for survivors for an appropriate amount of time, typically until adulthood for surviving children and to projected life expectancy for a surviving spouse. Also included are education costs, final expenses, and any other special expenses. These amounts are discounted back to the present to calculate the total funds needed. Any assets available are subtracted, and the amount remaining is the life insurance needed.

Both the human life value and needs analysis methods are demonstrated in detail in Section 5.

4.1.5 How Much Life Insurance Does One Need?

The optimal amount of life insurance for an individual will vary based on a number of factors. Some individuals with no dependents or bequest goals may not need any insurance, whereas an individual with young children and a non-working spouse may need a significant amount of life insurance. In this section, we outline some of the key considerations to use when determining how much life insurance to purchase.

The primary purpose of life insurance is to replace the present value of future earnings. A 65-year-old individual without children will experience an emotional loss from the premature death of a spouse, as well as some additional short-term expenses, but the economic loss will be modest (or even negative if expected spending needs fall in retirement). Other reasons to consider life insurance include the following:

- *Immediate financial expenses:* These include direct costs associated with death, such as funeral and legal expenses. Although the costs associated vary by region, funerals can be expensive and represent a potentially sizable financial burden on the family. Additional immediate financial expenses could include covering the short-term loss of wages.
- *Legacy goals:* In addition to income replacement, an individual may use life insurance to achieve certain legacy goals. These can include gifts to charities, bequests to family members, and estate planning.

To calculate the amount of insurance needed, one should estimate the amount of money needed to restore the present value of expected earnings that would have occurred if the earner remained alive. Because the purpose of life insurance is to smooth consumption by preventing a drop in spending from an unexpected premature death, the value of life insurance should be equal to the difference in household spending with and without the human capital of the earner. An accurate calculation will adjust household spending needs downward to compensate for the reduction in household size, in addition to estimating the present value of the expected human capital of the insured. The cost of the insurance is obviously an important consideration as well.

Another important consideration when purchasing life insurance is the insurance company's ability to meet its financial obligations. Company financial strength is evaluated by various rating agencies and is important because it provides an indication of the ability of the insurer to meet its obligations and to weather adverse market conditions.

EXAMPLE 11

Appropriateness of Life Insurance

Consider two potential life insurance candidates: (1) a 40-year-old doctor who is married with two young children, substantial student loans, and sizable earnings; and (2) a 35-year-old single person with a moderate amount of financial wealth. Based on the information presented, which person would be a more appropriate candidate for life insurance and why?

Solution:

The first individual is a much more appropriate candidate for life insurance. Given that the doctor has substantial debt and high earnings, the value of this individual's earnings potential (human capital) is significant. Likewise, with two young children, there is a high dependence on future earnings, representing another reason the earnings potential should be hedged with life insurance.

In contrast, the 35-year-old does not have any beneficiaries that would need to be supported. But the younger individual may want to consider purchasing insurance while he or she is still insurable.

4.2 Disability Income Insurance

Disability income insurance is designed to mitigate earnings risk as a result of a disability, which refers to the risk that an individual becomes less than fully employed because of a physical injury, disease, or other impairment. Many disabilities for gainfully employed individuals are relatively short rather than lifelong, but the financial disaster associated with the possibility of a lifelong disability can be addressed in a comprehensive risk management plan.

What is meant by disability? The definition of disability used by insurance providers typically specifies one of the following:

- Inability to perform the important duties of one's regular occupation
- Inability to perform the important duties of any occupation for which one is suited by education and experience
- Inability to perform the duties of any occupation

Consider a surgeon who loses the use of his or her dominant hand in an accident. By the first definition, this individual would likely be deemed fully disabled. By the second definition, this individual might be able to work as a general practitioner physician. By the third definition above, as long as the individual was able to be employed (e.g., as a professor at a medical school), he or she might not be considered disabled. For most people, especially professionals with specialized skills, policies that use the first definition are best, even though they are more expensive. In general, a disability income insurance policy will specify that some percentage of the difference between the pre-injury income and the post-injury income would be paid to the insured.

As with all insurance policies, disability income insurance policy standards vary widely in different jurisdictions and even for different companies. For most policies, the premium is fixed and based on the age of the insured at the time of policy issue, and the policies are underwritten for the health and occupation of the insured. Disability income coverage is available both through individual policies and through many employers. Disability income policies usually include provisions for partial and residual disability. Partial disability means that although the insured cannot perform all the duties of his or her occupation, the individual can perform enough to remain employed, albeit at a lower income. Partial disability provisions pay a reduced benefit, providing a financial incentive for the insured to get back to work as soon as possible. Residual disability refers to the possibility that although the insured can perform all the duties of his or her occupation, the individual cannot earn as much money as before. Consider the surgeon who can still perform operations but because of a back injury cannot perform as many surgeries per day as before the injury. The reduction in income would be addressed by the residual disability benefit, which is smaller than the benefit for full disability.

Typically, insurers will cover compensation only up to specific amounts. Furthermore, they will insure only up to a specific percentage of compensation, perhaps 60%–80%, for two reasons. First, if the insured becomes disabled, other expenses decrease, such as certain payroll taxes, commuting costs, clothing, and food; thus, full replacement is not necessary. Second, there is a greater chance for fraudulent claims if the disability income payments are close to the normal compensation.

Other aspects of disability income insurance include the following:

- The *benefit period* specifies how long payments will be made. A specified number of years may be stated in the policy, but typically, the benefit period lasts until normal retirement age, which varies globally between approximately 55 and 70. The age limit discourages the filing of fraudulent claims intended to substitute disability benefits for retirement income. Usually, a minimum number of years of benefits, perhaps five, is specified in case the individual should become disabled within that many years of the specified age. For example, a 62-year-old who becomes disabled would receive benefits to age 67. This provision encourages individuals to maintain their policies all the way to retirement.
- The *elimination period*, or *waiting period*, specifies the number of days the insured must be disabled before payments begin being made. Naturally, the shorter the elimination period, the higher the premiums. A typical elimination period for policies in the United States is 90 days.
- The *rehabilitation clause* provides payments for physical therapy and related services to help the disabled person rejoin the workforce as soon as possible.
- The *waiver of premium* clause specifies that premiums need not be paid if the insured becomes disabled, and it often includes a reimbursement of premiums during the elimination period.
- The *option to purchase additional insurance rider* allows the insured to increase coverage without further proof of insurability, albeit at the rate appropriate for the insured's current age.
- A *non-cancelable and guaranteed renewable* policy guarantees that the policy will be renewed annually as long as premiums are paid and that there will be no changes to premiums or promised disability benefits until, usually, age 65. Even if employment income declines during the working life, the monthly benefit will remain at the level specified in the policy.
- A *non-cancelable* policy cannot be canceled as long as premiums are paid, but the insurer can increase premiums for the entire underwriting class that includes the insured. This version is less expensive than a non-cancelable and guaranteed renewable policy, but one should be aware that insurance companies with significant loss experience are likely to raise rates.
- Inflation adjustments to benefits may be provided by a *cost of living rider*, which will adjust benefits with an accepted index or by a specified percentage per year.

Note that, as with virtually all insurance types, any provision in a disability insurance policy that appears advantageous to the insured party will likely increase the premium.

4.3 Property Insurance

Property insurance is used by individuals to manage property risk, which was discussed earlier in the reading. Although property insurance coverage applies to a multitude of situations, for most individuals, the primary areas to cover are the home/residence and the automobile.

4.3.1 Homeowner's Insurance

With regard to a residence, homeowner's insurance is designed to address risks associated with home ownership as well as risks associated with personal property and liability. Renter's insurance is similar to homeowner's insurance but without coverage on the structure. Property insurance protects the insured in case of loss related to his

or her property. As we discussed earlier, there are, of course, many different possible events relating to property risk, such as a house fire, an automobile collision, a stolen television, or a lost necklace.

Homeowner's policies may be specified as "all-risks," which means that all risks are included except those specified, or as "named-risks," which means that only those risks specifically listed are covered. All-risks policies are generally more costly. Homeowner's insurance may also be available in either of two versions, based on the way a claim is settled. A policy based on *replacement cost* will reimburse the insured person for the amount required to repair a damaged item or replace a lost, destroyed, or stolen item with a new item of similar quality at current prices. A policy based on *actual cash value* will reimburse the insured person for the replacement cost less depreciation. The replacement cost version is a more expensive policy.

As mentioned earlier in the reading, a *deductible* is the amount of a loss that must be absorbed by the policy owner before the insurance company will make any payment. Deductibles represent a form of active risk retention. If the homeowner's policy has a US\$1,000 deductible and there is hail damage of \$10,000, the homeowner must pay the first \$1,000 and the insurance company would be liable for the remaining \$9,000. Deductibles ensure that the homeowner retains some responsibility (and risk) associated with a loss.

As part of their business models, insurance companies price their policies to encourage the use of higher deductibles. For the consumer, this means that a cost-benefit analysis should be performed when determining the optimal deductible level because a larger deductible likely means a lower insurance premium. Imagine that a policy with a \$1,000 deductible for a given property has an annual premium of \$2,000 and a policy with a \$500 deductible has an annual premium of \$2,100. The consumer should recognize that selecting the second policy means essentially paying \$100 more for a \$1,000 insurance policy that has a \$500 deductible. An alternative way of looking at it is to ask whether it is worth \$100 to insure the second \$500 of loss.

Some individuals underinsure their homes to save money, but they do so at their own risk. If a potential loss could exceed the amount of insurance, that individual is retaining risk of that excess amount, either consciously or unconsciously. For individuals who have significant wealth, whose home is a relatively small percentage of their net worth, and who have adequate liquidity, it may make sense to self-insure these types of risks (i.e., maintain only a limited amount of homeowner's insurance or own a policy with a very high deductible).

Mortgage lenders typically require that the homeowner carry enough insurance that if the mortgagor dies, a total loss would trigger payment of an amount at least equal to the outstanding mortgage. Because mortgage balances typically decline over time, insurance contracts covering the outstanding mortgage can be purchased with a decreasing face value and decreasing premiums.

Insurance companies have a different interest from that of mortgage lenders. They want the house to be insured for its full value—less the value of the land because the land will not be destroyed—or at least a high percentage of full value. Premiums are calculated based on this assumption. Although the insurance company is obligated to pay only the face value of the policy in the case of a total loss, it is at a disadvantage if partial losses occur.

Consider a \$500,000 (replacement cost) home that, because inflation in home prices has been ignored, is insured for only \$250,000. In the absence of other contractual restrictions, if the house sustains \$250,000 of damage in a fire, the insurance company would have to pay the entire face value of the policy even though the house sustained only a 50% loss. From the company's standpoint, it should have been receiving the larger premiums for a \$500,000 house to pay \$250,000 for a 50% loss.

To offset this dilemma, losses are reimbursed at a lower rate if the home is underinsured. It is common for an insurance company to reduce payments if the home is insured for less than 80% of its replacement cost.

Homeowners' liability risks are typically addressed within the insurance policy on the home. That is, there is a provision in the policy for liability coverage for a specified amount in case, for example, a visitor is injured in an accident at the home. This coverage excludes professional liability, such as physicians' malpractice insurance, and business liability, which should be covered with separate policies. The homeowner's policy also excludes liability resulting from intentional acts—for example, throwing a chair through a neighbor's window.

Aside from purchasing homeowner's insurance, one can address homeowner risk through other risk management techniques. The following are some examples:

- Risk of theft of valuable financial documents can be avoided by storing them in a bank's safe deposit box.
- Risk of overall theft can be reduced through the use of high-quality locks, alarms, and surveillance systems.
- Risk of loss or corruption of electronic data can be avoided by storing backups offsite.
- Risk of damage to electronic equipment from a power surge can be reduced by installing surge protectors.
- Risk of loss from fire can be reduced through the use of fire-resistant building materials—and through the easy availability of fire extinguishers.

4.3.2 Automobile Insurance

Automobile property risk can also be addressed through various risk management methods. For example, one might avoid driving in inclement weather conditions. One might require passengers to wear seat belts, reducing their likelihood of injury. One might use common, frequently promoted safe driving techniques or even take alternate routes that are less risky. If buying a new car, one might consider a vehicle with a backup camera and lane-change warning system.

Automobile insurance rates are primarily based on the value of the automobile and the primary operator's age and driving record. Other factors are also included but vary considerably among jurisdictions. Coverages for damage to the automobile are typically divided into two parts. *Collision coverage* is for damage from an accident, and *comprehensive coverage* is for damage from other sources, such as glass breakage, hail, and theft. There may also be coverage available in case one's automobile is damaged by an uninsured or underinsured driver, as well as medical coverage for passengers in the insured's automobile. Insurance companies normally insure automobiles only up to the cost of replacing the automobile with one of the same make and model and in the same condition. If the cost to repair the automobile exceeds its actual cash value, the insurance company typically reimburses only the amount of the actual cash value.

As with homeowner's insurance, automobile owners typically retain some risk through the use of deductibles or by avoiding collision and comprehensive coverage. Again, selecting the amount of the deductible or rejecting property coverage involves a simple cost–benefit analysis. If the individual is able to bear the wealth risk and to afford repairs or a new car if damage occurs, then risk retention will increase expected wealth over time.

Liability associated with automobiles is typically covered under the same policy, with specified limits for bodily injury and property damage. In most countries, some level of third-party coverage is mandatory and additional insurance may be purchased to increase the level of protection. Liability limits often vary for different types of

loss—for example, higher limits to cover the costs of physical injury and separate limits to cover the loss of property. If actual liability in an accident exceeds these amounts, the automobile owner is responsible for the remainder.

4.4 Health/Medical Insurance

Any discussion of **health insurance** is highly dependent on the country of residence. In certain countries, health care is governmentally funded and there is no private health insurance. In others, there is a two-tiered system, with governmental coverage for everyone and upgraded coverage for additional payments.

In the United States, one type of insurance approach is called an *indemnity plan*, which allows the insured to go to essentially any medical service provider, but the insured must pay a specified percentage of the “reasonable and customary” fees. Another type of plan is a *preferred provider organization* (PPO), which is a large network of physicians and other medical service providers that charge lower prices to individuals within the plan than to individuals who obtain care on their own. A third type of plan is a *health maintenance organization* (HMO), which allows office visits at no, or very little, cost to encourage individuals to seek help for small medical problems before they become more serious.

Comprehensive major medical insurance covers the vast majority of health care expenses, such as physicians’ fees, surgical fees, hospitalization, laboratory fees, x-rays, magnetic resonance imaging (MRIs), and most other expenses that are “reasonable and customary” and part of generally accepted medical care. Aside from the premiums for the actual coverage, major medical insurance includes several other provisions that can substantially influence the total financial outlay. Below are some of the key terms of most health (medical) insurance plans:

- *Deductibles* refer to the amount of health care expenses that the insured person must pay in a year before any expense reimbursement is paid by the insurance company.
- *Coinsurance* specifies the percentage of any expense that the insurance company will pay, often 80%, with the insured person responsible for the remainder.
- *Copayments* are fixed payments that the insured must make for a particular service, such as a doctor’s office visit.
- *Maximum out-of-pocket expense* refers to the total amount of expenses incurred within a year beyond which the insurance company pays 100%. It is often expressed in terms of an individual maximum and a family maximum. This concept is often referred to as a stop-loss limit.
- *Maximum yearly benefit* refers to the maximum amount that the insurance company will pay in a year.
- *Maximum lifetime benefit* refers to the maximum amount that the insurance company will pay over an individual’s lifetime.
- *Preexisting conditions* refer to health conditions that the insured had when applying for insurance. They may or may not be covered by the insurance company, depending on the policy, laws, and regulations.
- *Preadmission certification* refers to a requirement that the insured receive approval from the insurer before a scheduled (non-emergency) hospital stay or treatment.

Of course, the cost of a plan will be affected by the degree of inclusion and specified value of the preceding provisions. Besides the cost of the plan, health insurance purchasers should be concerned about the breadth and quality of the network of physicians and hospitals available to insured individuals.

4.5 Liability Insurance

To manage liability risk, individuals often obtain **liability insurance**. It is possible that the amount of liability coverage in the homeowner's and automobile insurance policies is less than one thinks is appropriate. In that case, it is reasonable to purchase a *personal umbrella liability insurance* policy. This type of policy has specified limits but pays claims only if the liability limit of the homeowner's or automobile policy is exceeded. For example, consider an individual whose automobile policy specifies a property damage liability limit of US\$100,000 and who has an umbrella policy with a liability limit of US\$1 million. If that individual is responsible for an automobile accident that causes US\$300,000 of damage, the automobile policy would pay the first US\$100,000 and the umbrella policy would pay the remaining US\$200,000. Umbrella policies are relatively inexpensive.

It is common for people to think of liability insurance coverage in terms of protecting one's own financial assets. Some jurisdictions may specify exempt property—one's home or retirement savings, for example—that cannot be seized in the case that liability for an accident exceeds the amount of insurance coverage. Thus, one might ask oneself, "What is the worst thing that could happen to me in case of an extremely large liability judgment?" But if the goal is to indemnify the injured party—that is, to make the injured party "whole" financially—the amount of insurance purchased should be based on the potential financial catastrophe that could face an injured party.

4.6 Other Types of Insurance

Other types of risks may be present, depending on the individual's situation. For example, when purchasing a home, many individuals purchase *title insurance* (and in some jurisdictions, it is required). The purpose of title insurance is to make sure that ownership of the property is not in doubt. Personal watercraft and trailers may require a separate insurance policy or an endorsement, which is a form of insurance coverage added to an existing policy to cover risks that are not otherwise included in that policy. Again, appropriate levels of risk avoidance, reduction, prevention, and retention will depend on the situation and the size and probability of the potential loss.

One may consider service contracts when purchasing an automobile, home appliance, or other sizable product to avoid repair costs. These types of pseudo-insurance are profit centers for the companies selling them and are often relatively expensive for consumers, partly because of a lack of competition. For example, at the time of purchase of an automobile, one may be offered the opportunity to purchase an extended warranty at the same time from the automobile dealer. There is limited opportunity for price shopping, and the price of the service contract can usually be rolled into the automobile loan. Under these circumstances, the automobile dealer can charge a high rate to the disadvantage of the purchaser. Note that even this type of contract typically involves a deductible.

4.7 Annuities

Individuals have a finite but unknown lifespan. The efficient allocation of financial resources across an unknown lifespan is a planning challenge because consumption smoothing requires the allocation of available financial resources across an expected time frame. Humans may plan to spread their resources based on an average lifetime, but this strategy exposes them to the risk of outliving their assets in old age. One efficient strategy is to pool the risk of an unknown lifespan across individuals through the use of an annuity.

Annuities have existed in a variety of forms for thousands of years. The Romans sold a financial instrument called an “annua” that returned a fixed yearly payment, either for life or for a specified period, in return for a lump sum payment. Even today, annuities remain popular risk management tools, especially for older individuals and retirees who want to mitigate the risk associated with outliving their assets (i.e., longevity risk). Annuities are generally purchased from an insurance company; however, government pensions and payouts from employer pension plans are also technically annuities.

Annuities have become increasingly complex over time, and various types exist. With an **immediate annuity**, an amount of money is paid to the insurance company in return for a guarantee of specified future monthly payments over a specified period of time, either a number of years or the life of the insured, who is called the *annuitant*. A **deferred annuity** allows an individual to purchase an income stream to begin at a later date. We further discuss various forms of immediate and deferred annuities in the following sections.

The annuity payment guaranteed by the insurance company is most directly based on the amount of money tendered, the age and gender of the annuitant, and the insurance company’s required rate of return (including its cost of funds and its expense and profit factors). Although life insurance helps provide financial protection in case the insured “dies too soon,” immediate life annuities provide financial protection in case the insured “lives too long.”

In this section, we discuss some of the key aspects of annuities, such as the parties to an annuity contract, the different types of annuities that exist, payout methods, annuity taxation, and the appropriateness of annuities for individuals. We conclude with an overview of how annuities can benefit retirees and provide a framework that explains which retirees may benefit the most from an annuity.

4.7.1 Parties to an Annuity Contract

There are four primary parties to an annuity contract: the insurer, the annuitant, the contract owner, and the beneficiary. The insurer—generally an insurance company—is the entity that is licensed to sell the annuity. The annuitant is the person who receives the benefits. The contract owner is the individual who purchases the annuity and is typically the annuitant. In some instances, the contract owner and the annuitant may be different: For example, if the annuity is purchased by a company for a retiring employee, then the company is the contract owner and the employee is the annuitant. Lastly, the beneficiary is an individual or entity that will receive any proceeds upon the death of the annuitant. For contracts like a plain vanilla single-premium annuity, there may not be any death benefit; however, with variable annuities and annuities with some kind of minimum guaranteed payment period (e.g., 10 years), often referred to as a “period certain” option, there may be some residual value once the annuitant passes away.

4.7.2 Classification of Annuities

There are a variety of ways to classify annuities. The two most critical dimensions that help distinguish the primary types of annuities are (1) deferred versus immediate and (2) fixed versus variable. We will expand on these types shortly, but briefly, deferred annuities provide income that begins at a future date after the initial purchase of the annuity. In some cases, the original investment may retain some liquidity prior to initiation of annuity payments if the purchaser retains the right to sell the deferred annuity. In contrast, with immediate payout annuities—or single-premium immediate annuities (SPIAs), as they are often called—the individual permanently exchanges a lump sum for a contract that promises to pay the annuitant an income for life. For both deferred and immediate annuities, the annuity can be invested in what is termed a “fixed” account or a “variable” account.

Many other versions of annuities are available to meet different needs. For example, a *joint life annuity* is based on the expected lifespans of two annuitants, usually husband and wife, and payments are made as long as at least one of the two is alive. All else equal, the monthly payment is lower for this type of annuity because adding a second annuitant extends the payment timespan.

4.7.2.1 Deferred Variable Annuities In its most basic form, a deferred variable annuity is similar to a mutual fund, although it is structured as an insurance contract and typically sold by someone licensed to sell insurance products. With most deferred variable annuities, there is a menu of potential investment options from which an individual can choose. Typical investment options might include a pre-determined target risk asset allocation consisting of a diversified mix of securities managed by multiple investment managers. Many of the investment managers replicate popular mutual fund strategies for the annuity separate account. Compared with traditional investment programs (e.g., mutual funds), these annuities can be more expensive for investors, and the number of investment fund options within the programs may be limited.

Deferred variable annuity contracts may include a death benefit. A typical death benefit guarantees that the beneficiary named in the contract will receive the entire amount used to purchase the annuity—a feature that has value to the beneficiary only if the individual dies when the value of the contract is less than the initial investment. Like all features of deferred annuities, the death benefit creates a risk for the issuing insurance company. To offset this risk, the insurance company charges a fee. As with mutual funds, individuals maintain control of their money through the right to exit (or sell) the contract, although there can be considerable surrender charges for withdrawing one's money. Also, similar to mutual funds, a deferred variable annuity does not guarantee lifetime income unless the individual (1) adds an additional feature (a contract rider) or (2) annuitizes the contract by converting the value of the deferred variable annuity into an immediate payout annuity. It is worth noting that relatively few deferred variable annuity investors end up “annuitizing.”

Adding a guaranteed minimum withdrawal benefit for life rider to a deferred variable annuity can create a guaranteed income stream for life for the investor. The typical guaranteed minimum withdrawal benefit for life promises to pay the individual a fixed percentage (e.g., 4%) of the initial investment value as long as he or she lives. Each payment is subtracted from the current value of the deferred variable annuity contract. If the markets continue to perform well, the initial investment value may not be depleted, and any remaining value will go to the investor's beneficiaries. In a down market, the investment value may be depleted. If this is the case, the insurance company is contractually obligated to continue to pay the investor the guaranteed minimum benefit as long as the investor is alive.

4.7.2.2 Deferred Fixed Annuities Deferred fixed annuities provide an annuity payout that begins at some future date. For each dollar invested, the insurance company will tell the investor how much income he or she will receive when annuity payments commence at a specified age in the future. It costs considerably less for a 30-year-old to purchase a dollar of income for life starting at age 65 than it does for a 55-year-old to purchase a dollar of income for life starting at age 65. At any point prior to annuitization (i.e., conversion of the investment into an annuity), the investor can cash out and receive the economic value of the accumulated purchases less any applicable surrender charges, in which case the annuity contract is terminated. Once in retirement, the individual has two options: (1) cash out or (2) begin withdrawing the accumulated funds. In either case, the “economic value” of the accumulated purchases is annuitized, converting the deferred fixed annuity into an immediate fixed annuity (which we discuss in Section 4.7.2.4). In contrast to deferred variable annuities, which most investors choose not to annuitize, most deferred fixed annuities are eventually annuitized.

4.7.2.3 Immediate Variable Annuities With an immediate variable annuity, the individual permanently exchanges a lump sum for an annuity contract that promises to pay the annuitant an income for life. As the name suggests, the amount of the payments varies over time based on the performance of the portfolios that the assets are invested in. A common feature that can be added to an immediate variable annuity for an additional cost is an income floor that protects the annuitant in the event of a down market.

4.7.2.4 Immediate Fixed Annuities With immediate fixed annuities, the most common and most utilized type of annuity, an individual trades a sum of money today for a promised income benefit for as long as he or she is alive. The “income yield” for an immediate fixed annuity is the total amount of ongoing annual income received as a percentage of the initial purchase price. For example, if an individual purchases an immediate fixed annuity for \$100,000 and in exchange receives a guarantee to be paid \$8,000 per year for as long as the individual is alive, the income yield for the annuity would be 8%.

The income yield for immediate fixed annuities, or any type of annuity, varies based on a number of factors. One key factor is the age of the insured individual (or individuals). Exhibit 7 contains the payout rates for two different immediate annuity types: a life-only annuity (which pays benefits only as long as the individual is alive, with no residual benefits) and a life annuity with a 10-year certain payment (whereby benefits are guaranteed to last for at least 10 years). Quotes are included for three different types of annuitants: male, female, and joint (a couple). (The couple consists of a male and a female assumed to be the same age, and the survivor benefit is 100% of the primary benefit; that is, the benefit stays the same as long as either of the couple survives.)

Exhibit 7 An Example of Annual Payouts as a Percentage of Initial Premium

Life Only				Life with 10-Year Period Certain			
Age	Male	Female	Joint	Age	Male	Female	Joint
60	6.28%	5.87%	5.51%	60	6.15%	5.86%	5.42%
65	7.02	6.47	5.96	65	6.75	6.32	5.88
70	8.04	7.31	6.65	70	7.46	7.01	6.59
75	9.53	8.73	7.68	75	8.33	7.93	7.45
80	11.90	10.87	9.35	80	9.30	8.96	8.51
85	15.17	14.27	11.70	85	10.08	9.95	9.45
90	20.10	19.34	14.51	90	10.66	10.49	9.86

Source: www.immediateannuities.com (retrieved December 2014).

There are a number of important takeaways from Exhibit 7. First, the payouts (i.e., income yields) are higher when expected remaining longevity is shorter. For example, a male of 85 will receive a higher income yield than a male of 65 because the older male has a shorter life expectancy. A 65-year-old female will have a smaller payout than a 65-year-old male because females have a longer average life expectancy than males. The income yield is determined by estimating the average longevity of a given annuitant pool. A shorter average payment period will mean higher income for the older annuitants in the pool.

Another takeaway from the table is that the inclusion of a period certain (or return-of-premium feature) will reduce the payout, but to varying degrees. For example, adding the 10-year period certain has a relatively small effect on the income yield for

a 60-year-old male (which decreases from 6.28% to 6.15%), but it has a significantly greater impact for the 90-year-old male (whose payout rate decreases from 20.10% to 10.66%). Again, this difference is based on life expectancies. The probability of a 60-year-old male dying in the first 10 years is much smaller than the probability of a 90-year-old male dying over the next 10 years, so the payouts are adjusted accordingly. An individual who is concerned with lifetime income maximization is likely better off not adding any type of rider that includes a residual benefit; however, such a rider may be desirable if an individual has competing goals of generating lifetime income and providing some residual wealth for heirs.

In addition to mortality, another key variable that affects annuity pricing is the expected return the insurance company can earn on premiums. Because insurance companies tend to invest conservatively, the available yield on bonds provides a relatively good proxy, at least from a historical perspective, for how payout rates change over time. When current yields on bonds are lower than historical bond yields and life expectancies are increasing, payouts on annuities will be relatively low by historical standards. Low annuity yields may discourage many individuals from buying annuities if they believe that yields will eventually go back up. In reality, however, lower annuity payout rates simply reflect the increasing cost of hedging longevity risk using available investments.

4.7.2.5 Advanced Life Deferred Annuities The final type of annuity that we discuss is a hybrid of a deferred fixed annuity and an immediate fixed annuity. This so-called *advanced life deferred annuity* (ALDA) is often referred to as pure longevity insurance. Although it might sound a bit contradictory, ALDAs are deferred immediate payout annuities. Similar to an immediate fixed annuity, an ALDA involves the permanent exchange of a lump sum for an insurance contract that promises to pay an income. However, in contrast to an immediate payout annuity, for which the payments begin immediately, an ALDA's payments begin later in life—for example, when the individual turns 80 or 85.

Given that a specific monthly benefit may not begin until age 85, a deferred immediate life annuity would clearly cost less to purchase than a regular immediate life annuity. We note three reasons for this lower cost. First, because payments on the deferred annuity begin so far in the future, the insurance company has ample time to earn money on the amount tendered. Second, life expectancy for an 85-year-old is much shorter than for a 65-year-old, so the number of payments made will be fewer. Third, it is quite possible that the annuitant may actually die before any payments are made. For a relatively small premium, longevity insurance can provide additional security and can supplement income in later years.

EXAMPLE 12

Comparing Annuities

Compare fixed immediate annuities and variable immediate annuities.

Solution:

Both fixed and variable immediate annuities represent an irrevocable exchange of money for an insurance contract (the annuity contract). With a fixed immediate annuity, payments are “fixed” in either nominal terms or, in some cases, real terms, providing certainty about payment streams. With both fixed and variable immediate annuities, a common feature is a “period certain,” whereby the payments continue to a designated beneficiary for a specified period, typically 10 years.

4.7.3 Advantages and Disadvantages of Fixed and Variable Annuities

In this section, we discuss the relative advantages and disadvantages of both fixed and variable annuities. As a reminder, fixed annuities provide a benefit that is fixed (or known) for life, whereas variable annuities have a benefit that can change over time and that benefit is generally based on the performance of some underlying portfolio or investment. When selecting between fixed and variable annuities, there are a number of important considerations.

4.7.3.1 Volatility of Benefit Amount The most obvious difference between fixed and variable annuities is the type of benefit. Fixed annuities provide a constant income stream that is guaranteed not to change, whereas the income from a variable annuity could change considerably depending on the terms of the annuity payout. Retirees seeking a high level of assurance with respect to benefit payouts are likely better served by a fixed annuity, or a variable annuity that limits the possible change in the benefit over time. Retirees who are risk tolerant may be more interested in a variable annuity. If a retiree is willing to adjust his or her spending over time, that individual may be able to increase the amount spent each year by selecting a variable annuity for which the payment is linked to a risky portfolio of assets.

4.7.3.2 Flexibility The flexibility of an annuity varies materially with the type of annuity and its individual features. For example, an individual who purchases an immediate fixed annuity has effectively traded some amount of wealth for a guarantee of income for life. In most situations, this exchange is irrevocable: The individual who purchased the immediate fixed annuity cannot “undo” the transaction and request the original purchase amount back. The fact that these annuities are irrevocable makes sense from the insurer’s perspective because (in theory) if given the option, every individual would request the initial premium back.

Variable annuity payments are typically tied to the performance of an underlying subaccount. This subaccount can often be withdrawn by the annuitant, subject to limitations. Therefore, variable annuities can provide the annuitant with guaranteed income for life as well as the flexibility to access the funds should he or she (or they) need to do so. There may be penalties associated with withdrawing funds from a variable annuity, and in some cases, withdrawals may not be allowed (e.g., in the case of an immediate variable annuity).

4.7.3.3 Future Market Expectations A fixed annuity locks the annuitant into a portfolio of bond-like assets at whatever rate of return exists at the time of purchase. This scenario creates some interest rate risk because the value of these underlying securities will fall if interest rates rise.

If the annuitant assumes that interest rates will vary over time, he or she may be tempted to delay annuitization until interest rates rise. This delay, however, will reduce expected consumption during the delay period because the annuitant receives only market returns on investment assets and no mortality credits. Mortality credits, which will be discussed at greater length shortly, are effectively the difference between the future payout one would receive without pooling one’s investments and the future payout one receives when the investment pool includes individuals who have already passed away. Delay of annuitization may also expose the annuitant to the risk that life expectancies will systematically increase during the delay period, which would increase the cost of annuitization (i.e., decrease future potential available payouts). Annuitizing earlier allows the annuitant to hedge the risk of a large increase in future longevity for a population.

Variable annuities allow an annuitant to accept some variation in payments in return for the possibility of higher future payments if the market performs well. Because most retirees will rationally accept some market risk with their investment portfolio, this option allows individuals to increase their retirement income efficiency

by benefiting from both a mortality credit and a risk premium. The benefit of accepting market risk varies by type of annuity, and many variable annuity features limit the potential growth in income payments in future time periods. Variable annuities without growth-limiting features, such as minimum income guarantees, are most likely to provide a future income that outpaces inflation on average.

4.7.3.4 Fees The fees associated with variable annuities tend to be higher than those for fixed annuities. These higher fees come from a variety of factors but are primarily attributable to the costs of hedging market risk, administrative expenses, and reduced price competition. Evidence suggests that the price of insurance products is significantly affected by price competition, and immediate fixed annuities are much easier for a consumer to compare (the consumer will simply select the highest annuity payment for the amount he or she will spend). The opaque pricing of variable annuities can reduce price competition if consumers are unable to easily compare the relative efficiency of product characteristics. A thorough price analysis may require weighing the possible added costs of opaque variable annuity features—perhaps using analytical tools to help assess these costs—against the benefits of a potentially higher return.

4.7.3.5 Inflation Concerns Inflation can have a significant negative impact on the real income received from a fixed annuity. For example, if annual inflation averages 3%, after approximately 24 years, the income would be worth approximately half as much as it was worth when the annuity began. In their purest form, fixed annuities are nominal and will not change with inflation; however, it is possible to create a partial inflation hedge by having benefits “step up” some predetermined amount each year (e.g., 3%). Although this adjustment is not a perfect inflation hedge, it does provide a mechanism to ensure that payments increase over time. There are a number of variable annuities (and riders on fixed annuities) that allow the payments to increase or decrease based on changes in inflation. An individual interested in guaranteeing some lifetime level of income that changes with inflation may find these types of policies or riders valuable.

4.7.4 Payout Methods

The payout methods available from an annuity are similar regardless of whether the annuity is fixed or variable. In certain instances, the annuitant is unable to choose the payout method, especially with some types of government pensions, but there is generally some level of choice when purchasing a private annuity from an insurance company. The primary payout methods were discussed previously but are summarized again here:

- *Life annuity*: Payments are made for the entire life of the annuitant and cease at his or her death.
- *Period-certain annuity*: Payments are made for a specified number of periods without regard to the lifespan or expected lifespan of the annuitant.
- *Life annuity with period certain*: This payment type combines the features associated with a life annuity and a period-certain annuity, so payments are made for the entire life of the annuitant but are guaranteed for a minimum number of years even if the annuitant dies. The most common length of the period certain is 10 years. For example, if the annuitant dies after 6 years, a life annuity with 10 years period certain will make payments to the annuitant's beneficiary for the remaining 4 years and then cease.

- *Life annuity with refund:* This type is similar to a life annuity with period certain, but instead of guaranteeing payments for life or for a certain number of years, a life annuity with refund guarantees that the annuitant (or the beneficiary) will receive payments equal to the total amount paid into the contract, which is equal to the initial investment amount less fees.
- *Joint life annuity:* With a life annuity on two or more individuals, such as a husband and a wife, payments continue until both members are no longer living. For example, a married couple may purchase an immediate annuity that pays a monthly benefit as long as either one of them is alive. The contract states the benefit that the survivor will receive, which can be as much as 100% of the primary benefit or a smaller amount, such as 50% or 75% of the full benefit. The annuity payments cease when the survivor passes away.

It is important to note that the payout methods are not mutually exclusive. In theory, one could combine each of the different methods into a single annuity. Annuity payments can also be made at different frequencies, such as monthly, quarterly, or annually, although monthly payments are generally the most common. It is also possible to include riders or other methods that specify how the benefit may change over time. For example, it is possible to purchase an annuity for which the payment increases by some fixed percentage (or amount) each year.

4.7.5 Annuity Benefit Taxation

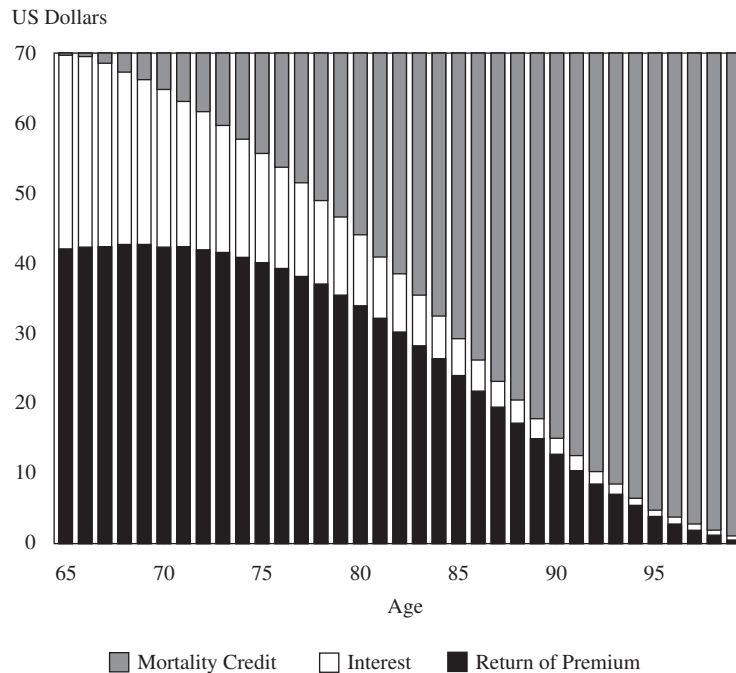
In some locations, annuities can offer attractive tax benefits, such as tax-deferred growth. For example, in the United States, the growth in an annuity is taxed only when the individual receives income from the annuity. This presents an opportunity for tax-deferred growth, especially for someone who purchases the annuity at a relatively young age or has exhausted other tax-sheltering alternatives. The actual taxation of the benefits varies considerably by type of annuity but is generally based on some average of the difference between the amount paid for the annuity and the benefits received.

The actual method of taxation varies materially by country, and before purchasing an annuity or recommending an annuity for a client, one should become familiar with the applicable tax consequences or consult a local expert on annuity taxation. In general, the potential for tax deferral, combined with a high marginal tax rate on alternative investments, may make annuities attractive for retirees.

4.7.6 Appropriateness of Annuities

When creating an income stream from a pool of assets, each retiree has a choice. The individual can choose either to receive periodic withdrawals from an investment portfolio (i.e., not annuitize) or to purchase an annuity (i.e., annuitize). This decision is obviously based on a variety of factors and preferences. When discussing the potential benefits of annuitizing, it is important to understand the concept of mortality credits (which we briefly mentioned earlier). Each payment received by the annuitant is a combination of principal, interest, and mortality credits. Mortality credits are the benefits that survivors receive from those individuals in the mortality pool who have already passed away. It is possible to demonstrate this effect visually using a chart (see Exhibit 8).

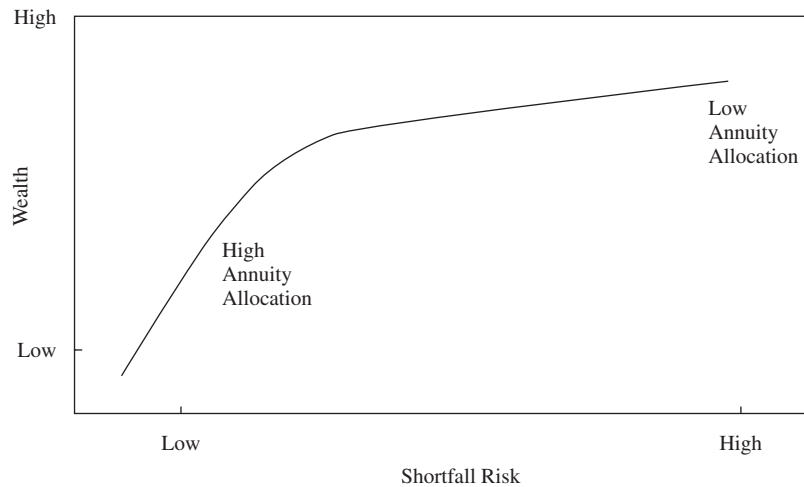
In Exhibit 8, we show an example of mortality credits for US male individuals, using male mortality rates based on the Society of Actuaries' 2012 Individual Annuity Reserve Table and an interest rate of 3%. We also assume that the individual receives US\$70 of annual income for life for an approximate initial cost of US\$1,000. Given these assumptions, the annual benefit payment can be decomposed into three parts: interest (based on the remaining assets from the initial investment minus benefits paid), return of premium, and mortality credits.

Exhibit 8 Mortality Credits

An individual who self-insures longevity risk would receive only (approximately) the interest and return-of-premium portions of Exhibit 8. The additional mortality credits arise because some individuals will pass away early, thereby subsidizing the future benefits of those individuals who are still alive. In this way, an individual can receive more income and additional certainty from purchasing an annuity. However, this certainty comes at a cost because the expected benefits of an annuity are generally not positive. Annuities are a form of insurance, and most forms of insurance, by definition, do not (and should not) have a positive expected value because it would imply that the insurance company lost money on the average policy sold. Moreover, it would likely not be advantageous to purchase an annuity from an insurance company that lost money on the average policy sold because that company would likely eventually go out of business and no longer be able to fund future expected benefit payments.

Therefore, an individual who purchases an annuity is acquiring the benefit of certainty regarding lifetime income in exchange for accepting lower potential wealth at death, as well as lower lifetime income depending on the cost of the annuity. This perspective can be used to create a “retirement income efficient frontier” whereby the decision of how much to annuitize is based on an individual’s preference for wealth maximization and aversion to running out of money. This concept is similar to the traditional Markowitz (1952) efficient frontier; but for the retirement income efficient frontier, wealth replaces expected returns on the vertical axis and shortfall risk (which is defined approximately as the risk associated with running out of money over one’s lifetime) replaces standard deviation on the horizontal axis. The exact definitions of “wealth” and “shortfall risk” (as well as the terms themselves) have varied across literature but still tend to be relatively consistent. The concept of the retirement income efficient frontier, which is displayed visually in Exhibit 9, is derived from Chen and Milevsky (2003), among others.

Exhibit 9 Retirement Income Efficient Frontier



Certain factors can generally be expected to affect a retiree's demand for annuities, either positively or negatively. For example, the following factors would generally suggest increased demand for an annuity:

- Longer-than-average life expectancy
- Greater preference for lifetime income
- Less concern for leaving money to heirs
- More conservative investing preferences (i.e., greater risk aversion)
- Lower guaranteed income from other sources (such as pensions)

The broad international shift away from defined benefit plans and toward defined contribution plans has increased the demand for annuities. Therefore, it is important to have an understanding of annuities and which individuals they are most likely to benefit.

IMPLEMENTATION OF RISK MANAGEMENT FOR INDIVIDUALS

5

A variety of factors need to be considered when implementing an optimal risk management strategy for an individual or a household. In this section, we will indicate how human capital affects the asset allocation decision, provide a case study analyzing and critiquing an insurance program, and present appropriate strategies for asset allocation and risk reduction for a given investor.

5.1 Determining the Optimal Risk Management Strategy

As with portfolio selection, the decision to retain risk or to manage risk through insurance or annuities is determined by a household's risk tolerance. At the same level of wealth, a more risk-tolerant household will prefer to retain more risk—either through higher insurance deductibles or by simply buying little or no insurance—than a less risk-tolerant household. Additionally, the amount of overhead and administrative expenses built into the cost of the insurance (the load) will vary by product.

If an individual decides not to insure a risk exposure, he or she may still choose to moderate the impact of a potential loss. The term *loss control* refers to efforts to reduce or eliminate the costs associated with risks. There are three general approaches to loss control. *Risk avoidance* is the purest form of loss control. That is, one can remove the possibility that an event involving loss will occur. For example, one may avoid the risk of loss of a collector car or piece of jewelry by selling the asset. This strategy can be particularly appealing if the asset is no longer providing significant utility, or if the magnitude of the risk exposure rises because of price appreciation. Two other types of loss control are *loss prevention* and *loss reduction*. Loss prevention is the process of taking actions to reduce the probability that a loss event will occur. For example, installing a security system reduces the probability of a break-in that could lead to a loss by theft. Operating an automobile that has a backup camera reduces the probability of causing property damage or personal injury when the automobile is backing up. Installing a swimming pool alarm reduces the probability that a child will drown. Loss reduction is the process of seeking to reduce the size of a loss if a loss event occurs. For example, maintaining a high-quality fire extinguisher in the kitchen may allow a homeowner to contain a fire that would otherwise cause extreme damage. Unlike the loss prevention examples, the fire extinguisher does not reduce the likelihood of the loss event.

As initially discussed in Section 3.1.3, in addition to risk avoidance and risk reduction, individuals can also manage risk through the techniques of *risk transfer* and *risk retention*. Although risk transfer generally involves insurance or annuities, individuals can also use *non-insurance risk transfers* in many situations, and these usually take the form of contracts. For example, an apartment renter may select a long-term lease to lock in the amount of the monthly rent for a longer time during a period of inflation, thus transferring the risk of increased rent to the landlord, who then must absorb the opportunity cost. Incorporation of an individual's business provides a non-insurance risk transfer in many countries. By incorporating, the individual shields his or her personal financial assets from any legal judgment in which the business is found to be at fault.

A systematic risk management approach would be to consider the optimal strategy for each risk exposure. Some guidelines are helpful in deciding when it is appropriate to accept (retain) risk, when it is best to reduce the potential magnitude (or severity) of the risk, and when it makes sense to transfer risk. Small-magnitude risks below a risk retention limit should be retained (i.e., self-insured) and the magnitude/severity reduced to the point where the expected cost is equal to the expected benefit. For example, installing a high-quality fire-rated roof on a house may reduce both the probability of a fire (e.g., from sparks from a house fire next door) and the potential damage from a fire. However, the cost of installing a new, expensive roof may be too high to be justified. In this case, the large-magnitude potential loss from fire can be transferred through property insurance and a deductible can be used to set the optimal amount of risk retention.

A common risk management approach is summarized in Exhibit 10.

Exhibit 10 Risk Management Techniques

Loss characteristics	High frequency	Low frequency
High severity	Risk avoidance	Risk transfer
Low severity	Risk reduction	Risk retention

An insurance product can provide indemnification by ensuring that there will be no (or minimal) loss in economic net worth. For example, an insurance claim will provide reimbursement of flood damage to a \$20,000 vehicle if the household has a comprehensive insurance policy. If not, the household risks reducing its economic net worth by the size of the loss exposure. Indemnification in life insurance can be more complex. A human life value analysis seeks to replace the loss in human capital. A needs analysis (as discussed in Section 4) estimates the present value of future consumption that would need to be replaced if the income of a primary earner were lost.

EXAMPLE 13

Risk Management Strategy

Describe *loss control* in risk management.

Solution:

Loss control refers to efforts to reduce or eliminate costs associated with risks. A simple method of loss control is to avoid risks (risk avoidance)—for example, by not engaging in high-risk hobbies, such as rock climbing. Another approach to loss control is loss prevention, in which one attempts to reduce the likelihood of a risky event. For example, one may install an alarm system to discourage burglars. Loss reduction refers to approaches that attempt to minimize the size of the loss if a risky event does occur. For example, an airbag in an automobile does not reduce the likelihood of an accident, but it may reduce the seriousness of injuries sustained by those involved in an accident.

5.2 Analyzing an Insurance Program

This section provides a case study of how one might analyze an individual's insurance needs and design an insurance program. In this case, Jacques and Marion Perrier are 40 years old and 38 years old, respectively. They have two children: Henri, age 8, and Émilie, age 6. Jacques is a manager of technical services for a large corporation and earns €100,000 per year. Marion works part-time as a nurse, earning €20,000 after tax per year but plans to return to full-time work in 10 years, when Émilie turns 16. Marion expects that, with adjusted market conditions and after 10 years of inflation, she will earn €60,000 after tax per year as a full-time nurse at that time. Jacques and Marion are in excellent health and maintain a lifestyle that is well within their income.

The family lives in the city in a comfortable condominium that they bought for €250,000 five years ago and that is currently valued at €300,000. They owe €190,000 on a mortgage that still has 25 years to maturity. Although both Jacques and Marion take public transportation to work, they have an automobile, which is 10 years old but in excellent condition with relatively few kilometers of use. Jacques and Marion intend to live in the condominium at least until Jacques's planned retirement at age 60. At that time, they will decide whether to remain in the condominium or move to the small town nearby where Jacques grew up.

Four years ago, when his parents died, Jacques inherited the moderately sized but attractive home where he grew up. It was worth €150,000 at the time and has increased in value to €165,000 (a 10% increase during this period). For two years, the family tried to use the house as a weekend retreat, but they discovered that their children's activities and the desire to go to different places caused them to use the house infrequently. For the past two years, they have rented the house to a middle-aged couple

who have no children. There is no debt on the house, and the rent is enough to pay for taxes and other expenses and to generate positive cash flow that Jacques and Marion are using for family vacations.

Both of Jacques's parents died at age 70. Marion's father died at age 80. Her mother, Françoise, is in good health at age 72, and women in her family have generally lived to very old ages. Françoise has a pension but does not have much in assets.

5.2.1 Current Insurance Plan

Life Insurance. Jacques bought a whole life insurance policy with a death benefit of €200,000 when Henri was born. Jacques is the insured, and his estate is the beneficiary. His employer also provides a €50,000 term life insurance policy that names Marion as the beneficiary. There is no life insurance on Marion.

Health Insurance. The family is covered by a national health insurance plan.

Disability Insurance. Jacques's employer provides short-term disability payments for up to six months. As a part-time employee, Marion has no disability benefits.

Long-Term Care Insurance. Elderly individuals in Jacques and Marion's country are eligible for long-term care at a cost equal to 75% of their pension benefits.

Property Insurance. The exterior of the condominium is insured through the condominium owners' association. The insured value is increased annually to consider current market and replacement values. Jacques and Marion have a property insurance policy on the contents of their condominium for €20,000. Jacques's parents insured the house for €100,000 15 years ago. They never increased the coverage, and Jacques has maintained the same policy. The automobile has coverage for liability and collision, as well as comprehensive coverage.

Data Summary

- Jacques: age 40; €100,000 annual earnings; €200,000 whole life insurance policy; €50,000 term life insurance policy
- Marion: age 38; €20,000 annual earnings after tax; no life insurance
- Children: Henri, age 8, and Émilie, age 6
- Condominium: €300,000 current value; €190,000 25-year remaining mortgage; exterior of building fully insured; contents insured for €20,000
- Rental home: €165,000 current value; no mortgage; insured for €100,000

5.2.2 Program Review

Life Insurance. As we discussed in Section 4.1.5, two approaches are commonly used in calculating life insurance needs. The first is the human life value method, which estimates the present value of earnings that must be replaced. As we will demonstrate, the human life value method indicates that Jacques should purchase approximately €1.11 million of additional life insurance. The second approach is the needs analysis method, which estimates the financial needs of dependents. As we will also demonstrate, the needs analysis method indicates that Jacques should purchase approximately €1.25 million of additional life insurance.

Of course, there is no absolute when calculating life insurance needs because there are so many variables and uncertainties. However, in this case, the two methods generate relatively close numbers. To augment Jacques's current life insurance program, he should purchase at least €1 million in additional term life insurance, but €1.25 million would be more desirable.

Although an annually renewable term policy will be less expensive, a 20-year level term policy should be considered. At the end of 20 years, Jacques will be nearing the end of his working career and the children will be fully grown. Jacques and Marion will have accumulated a high enough level of savings that income replacement will be unnecessary. At that time, the term policy can be allowed to lapse and the €200,000 whole life policy can be retained.

Whole life coverage like Jacques's current policy is relatively expensive, but the pricing and cash build-up at this point in the policy's life indicate that it is probably wise not to replace the policy with term coverage now. Even though life insurance rates have fallen as life expectancies have lengthened and competition has increased, the decline is probably not enough to offset the advantages of the whole life policy at this point. In addition to providing life insurance coverage, the policy's cash-value buildup can be considered a conservative part of the asset allocation of the retirement portfolio.

Marion should be named as the primary beneficiary on the new policy, with Henri and Émilie as secondary beneficiaries, although countries may differ on the exact approach for designating a beneficiary who is a minor. It may be advisable to name a custodian and/or create a trust for Henri and Émilie until they reach adulthood. The old policy should be changed to include these beneficiary designations as well. Making death benefits payable to the estate, as is the case currently on the whole life policy, can make receipt of payments much slower and may subject benefits to greater taxation.

Although Marion's income is modest, her death would cause a financial burden in terms of both lost income and added expenses to replace her family and household responsibilities. Furthermore, her income will increase when she returns to full-time work in 10 years, and financial responsibility for the children will still exist at that time. At Marion's current age and with her excellent health, and because she is female, life insurance rates are very low. However, it is possible that a health issue or accident could cause her rate to increase or even make her uninsurable. Given the complexity of Marion's situation, it is difficult to calculate a recommendation for the amount of life insurance needed.

Life insurance companies typically offer lower rates for larger amounts of coverage in a series of steps. For example, the price per €1,000 of coverage may decrease at €100,000, €250,000, €500,000, and €1,000,000 of coverage. But companies are hesitant to underwrite policies that are large relative to the insured's human life value, or the discounted value of future earnings. A €250,000 policy would take advantage of the price break but would be relatively large for Marion's current income. Still, it is justifiable based on her future employment plan. Purchasing a policy of this size will provide adequate protection for the 10 years until she goes back to work full time, and at that point the children will be more independent, reducing the need for life insurance. As with Jacques, a 20-year level term policy is reasonable.



Life Insurance Needs For Jacques and Marion

As mentioned previously, the *human life value* method is consistent with the concept of human capital and involves replacing the estimated net contributions to family finances that Jacques would generate if he did not die during his projected earning life. Calculating these contributions involves the following steps:

- Start with the actual pre-tax compensation that Jacques would receive from employment: €100,000.
- Adjust for income taxation, and here we assume a 30% rate: $€100,000 - €30,000 = €70,000$ post-tax compensation.

- Adjust for family expenses attributable to Jacques that will not exist after his death, such as his transportation, travel, clothing, food, entertainment, and insurance premiums. Here, we assume those expenses to be €20,000. So $€70,000 - €20,000 = €50,000$ income after expenses.
- Add the value of any non-taxable employee benefits that the family will no longer receive, such as employer contributions to retirement plans, which we assume to be €15,000: $€50,000 + €15,000 = €65,000$.
- Estimate the amount of pre-tax income needed to replace that income on an after-tax basis. Note that the rate of taxation of annual income generated from life insurance proceeds may be different from the rate of taxation of Jacques's employment income, and marginal rates may be lower for lower incomes. Here, we assume a 20% tax rate: $€65,000 / (1 - t) = €65,000 / (1 - 0.20) = €81,250$.
- We then apply an annual growth rate, assumed here to be 3%, to consider the effects of inflation and career advancement over the full 20 years until retirement.
- Finally, we discount all the future cash flows back to the present at an appropriate rate, assumed here to be 5%.

Assuming the lost income replacement would be needed by Jacques's family immediately, the human life value calculation can be solved as the present value of an annuity due with growing payments (a so-called "growing annuity due"). Using calculator keystrokes for an annuity due with level payments, the growth of payments can be incorporated by adjusting the discount rate to account for the growth rate of earnings. The adjusted rate i can be calculated as follows, as long as the discount rate is larger than the growth rate:³ $[(1 + \text{Discount rate}) / (1 + \text{Growth rate})] - 1$, or $(1.05 / 1.03) - 1 = 1.94\%$. Thus,

- set the calculator for beginning-of-period payments;
- $n = 20$ (the number of years until retirement);
- payment = €81,250; and
- $i = 1.94\%$.

Solving for the present value of an annuity due, the human life value method recommends €1,362,203 of life insurance for Jacques. Because Jacques already has €250,000 of life insurance, he should purchase an additional €1,112,203, according to this method. This amount would likely be rounded to €1.1 million.

As discussed in Section 4 of this reading, the *needs analysis* method is concerned with meeting the financial needs of the family rather than replacing human capital. Needs analysis typically includes the following steps, which are presented in greater detail in Exhibit 11:

- Estimate the amount of cash that will be needed upon the death of the insured person. This amount will include final expenses (funeral and burial) as well as any taxes that may be payable. It is also common to pay off all debt (including mortgages) and to fully fund future education costs. An emergency fund should be created.
- Estimate the capital needed to fund family living expenses. This calculation requires discounting estimated living expenses (i.e., calculating the present value of future cash flow needs) during multiple time frames, typically as follows:
 - Estimate the surviving spouse's living expense needs, assumed here to continue for 52 years, until Marion is 90 years old. Note that when the mortgage and other debts are paid off, living expenses are lower.
 - Estimate the children's living expense needs, assumed here to continue until they are 22 years old. This amount does not include the education fund.

³ Most individuals' situations would call for a discount rate that is higher than the inflation rate. If that is not the case, or if future cash flows are not projected to grow at a constant rate, the present value can be calculated in the typical manner as the present value of a series of unequal payments.

- Include an additional amount for extra expenses during a transition period after Jacques's death, perhaps covering two years. In general, this period recognizes that there may be some contractual obligations, such as a car lease, that may not terminate upon a person's death.
- Consider Marion's future income (earnings). Note, however, that Marion may prefer not to go back to work full time as soon as planned because of the extra responsibilities of being a single parent. She may even choose to resign from her part-time job.
- Calculate total needs as the sum of cash needs and capital needs.
- Calculate total capital available, which may include cash/savings, retirement benefits, life insurance, rental property, and other assets.
- Calculate the life insurance need as the difference between the total financial needs and the total capital available.

Exhibit 11 is a representation of a needs analysis for Jacques.

Exhibit 11 Financial Needs: Life Insurance Worksheet

Cash Needs	Euro (€)
Final expenses	10,000
Taxes payable	5,000
Mortgage retirement	190,000
Other debt	10,000
Education fund	200,000
Emergency fund	30,000
Total cash needs	445,000
Capital Needs [present value of annuity due: growth rate = 3%, discount rate = 5%, adjusted rate (as above) = 1.94%]	
Marion's living expenses (60,000/year for 52 years)	1,991,941
Children's living expenses:	
Henri (10,000/year for 14 years)	123,934
Émilie (10,000/year for 16 years)	139,071
Transition period needs (10,000/year for 2 years)	19,810
Less Marion's income:	
Until Émilie is 16 (20,000/year for 10 years)	–183,713
Age 48–60 (60,000/year for 12 years)	–398,565 ^a
Total capital needs	1,692,478
Total Financial Needs	2,137,478
Capital Available	
Cash and savings	30,000
Vested retirement accounts—present value	200,000
Life insurance	250,000
Rental property	165,000
Total capital available	645,000

(continued)

Exhibit 11 (Continued)

Cash Needs	Euro (€)
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Life insurance need (Total financial needs less total capital available)	1,492,478
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^a Calculated in two steps: (1) Compute the amount needed in 10 years, when Marion will begin earning €60,000 per year. Assuming 12 years of earnings from age 48 to age 60, a 3% annual growth in earnings, and a 5% discount rate (1.94% adjusted discount rate), a present value of an annuity due calculation shows that €649,220 will be needed in 10 years. (2) Discount the €649,220 back to the present—10 years at the unadjusted discount rate of 5%—for a total of €398,565. The discount rate is not adjusted during this period because there are no payments to which a growth rate would be applied. We simply discount a future value to the present.

This amount of life insurance under the needs analysis method would likely be rounded to €1.5 million—considerably higher than the €1.11 million calculated earlier using the human life value method. The amount of life insurance selected may depend on which method seems to be more relevant to the family situation. One may view the two values as a reasonable range and use the larger number, the smaller number, or perhaps an average of the two. In many cases, selection of an amount may be further affected by “breakpoints” in the insurance company’s premium schedule. The premium rate may decline when insurance coverage reaches, for example, €250,000, €500,000, and €1,000,000.

As a final note, consider that if Jacques dies prematurely, there will be an increased need for life insurance for Marion while Henri and Émilie are still children.

5.2.3 Recommendations

Health Insurance. Although the Perrier family is covered by national health insurance, they may want to seek private health insurance. In many countries, this type of coverage provides quicker treatment, a wider choice of physicians, and a higher standard of care.

Disability Insurance. Both Jacques and Marion should consider long-term disability income insurance that guarantees the option to purchase additional coverage without underwriting. This type of policy would allow them to increase coverage as their incomes increase. They should look for “own occupation” coverage that specifies that they would be considered disabled if they could no longer perform the duties of their current positions. They should also select a benefit period that extends at least until their respective retirement ages, possibly age 65. For Jacques, a relatively long, 180-day elimination period would coordinate well with his company’s short-term disability plan and would save money. Marion should consider a shorter elimination period, perhaps 90 days, because she has no short-term coverage. Both should choose an option that allows increased coverage based on inflation.

Taxation should be considered in purchasing a disability income policy. In some jurisdictions, premium payments may be deductible for income tax purposes but benefits are taxed. In others, it may make a difference whether the policy is purchased individually or through the employer. In any case, the amount of the benefit selected should be sufficient to replace income, net of any tax advantages and reduction of expenses. Most insurance companies do not like to sell policies with benefits that represent more than 70%–80% of an individual’s income (less for high-income individuals) because high percentages create a moral hazard, in that the insured may decide that declaring a disability would give him or her a larger net income without the need to work.

Long-Term Care Insurance. Although the Perriers' country provides some degree of long-term care assistance, it is possible that the facilities available are not of the standard that would satisfy them. Furthermore, the pricing structure appears to strongly favor individuals with limited income. The Perriers should consider long-term care insurance for themselves, especially if there is a coordination provision with the national plan. At their current ages, rates would be reasonable and would be locked in at the time the policy is purchased. Although stays in long-term care facilities are typically shorter than five years, it would be prudent to purchase a policy that does not have a time limit. Most policies have benefits that are based on a specified amount of money per day. The amount selected should be appropriate for the local cost structure, and the Perriers should pay the extra premium required to receive an automatic inflation adjustment, both before and after any claim.

Long-term care insurance may also be appropriate for Marion's mother, especially because women in her family tend to have long lives. This coverage will be more expensive at her age, but it would alleviate the potential need for care in the home, which would probably be provided by Marion. To avoid the financial and psychological stress of providing home care, a long-term care policy would be useful.

Property Insurance. Jacques and Marion should check to make sure that the condominium association's insurance coverage is sufficient for the structure. They should also determine whether that policy provides any coverage for contents and, if so, to what extent. It is likely that the condominium association's coverage for contents, if any, is modest, and Jacques and Marion undoubtedly have personal property worth far more than the €20,000 of coverage in their personal policy.

The Perriers should make a thorough valuation of their personal property, even though this is a cumbersome task, and make sure they have or obtain a sufficient amount of coverage. A prudent approach that helps avoid insurance claim problems is to make a written and/or photographic inventory of all contents and improvements within the condominium. Any personal property that has specified limits within their policy should be appraised and scheduled. For example, an expensive necklace should be taken to a jeweler for a formal appraisal, after which the necklace should be added to the insurance policy, which will likely require a higher premium. A copy of the appraisal and inventory should be provided to the insurance company, and another copy should be kept off site in case of a disaster in their condominium.

Property insurance on the house should be reviewed. It appears that the amount of coverage is far less than appropriate. Furthermore, it is not clear whether the transfer of ownership of the property is properly noted on the policy. In the case of a claim, Jacques and Marion may have to deal with legal issues in order to collect. Even if the property ownership issue is clarified, it is likely that the house is insured as the Perrier's residence or secondary residence. However, it is now a rental house, and it requires a different insurance policy. They should also determine whether the rental house's contents are included in the policy. Because they probably are not, it would be worthwhile to explain to the renters that they should obtain their own insurance on the contents (their property). This step is especially important because the Perriers could be considered liable for any loss of the renters' property if, for example, there is a fire caused by faulty wiring.

With regard to auto insurance, the Perriers should make sure that they have substantial liability insurance coverage, especially because it appears that they will have substantial assets to protect. However, they may want to consider whether collision and comprehensive coverage are cost effective for a 10-year-old automobile. Because they seem to drive relatively little, it may make sense to self-insure.

With sufficient liability coverage on the condominium and the auto, the Perriers may qualify for umbrella liability insurance. They should consider this relatively inexpensive coverage to provide additional liability protection relating to the auto and

condominium. As a nurse, Marion may want to consider professional liability insurance if it is not provided by her employer. If either Jacques or Marion serves on any type of board of directors of a corporation, public service, or other entity, they should make sure that that entity provides appropriate liability coverage for its directors.

Longevity Insurance. Marion's mother may be an excellent candidate for longevity insurance. As noted earlier, longevity insurance is typically structured as a life annuity with payments beginning at some future date, such as age 85. Because it is not underwritten, it is generally a poor choice for someone whose life expectancy is shorter than average for his or her age and a good choice for someone whose life expectancy is longer than average, as is the case with Marion's mother. The annuity payments would not start for more than a decade, but they would offer additional income in her later years and help combat inflation, and the cost would be relatively low. Longevity insurance may be viewed as a complement to or even a partial substitute for long-term care insurance. A cost-benefit analysis of the available options should be performed to ensure that the policy selected best matches the goals and financial resources of the household.

5.3 The Effect of Human Capital on Asset Allocation Policy

There are two primary ways to consider how the different subcomponents of an individual's total economic wealth should affect portfolio construction. The first is asset allocation, which includes the overall allocation to risky assets. The second is the underlying asset classes, such as stocks and bonds, selected by the individual. For example, an individual who works in a risky profession that has a high correlation with the stock market might first choose a less aggressive portfolio (e.g., with a lower allocation to stocks than the average person of the same age). Next, the investor would select which individual stocks and bonds (or asset classes) to hold to minimize the overall risk of the portfolio within a total wealth framework.

For many people and for many occupations, human capital is generally considered to be a relatively bond-like asset. For example, dividend growth in the S&P 500 Index exhibited a quarterly volatility of 16.4% from first quarter 1948 to fourth quarter 2013, whereas wage growth volatility was closer to 2.5% over the same period.⁴ Among individuals, occupation can have a large impact on the degree of wage growth volatility. For example, Oyer (2008) found that stock market conditions can have a strong impact on the lifetime earnings of MBA students. Asset performance that is strongly correlated with the lifetime earnings of a worker will provide less hedging benefit because the assets magnify, rather than reduce, variability in consumption.

EXAMPLE 14

Human Capital and Asset Allocation (1)

The riskiness of human capital, as well as that of other assets, should affect the allocation of an individual's financial capital. Consider three investors: George, John, and Sam. Each investor owns only two assets—human capital and financial capital—and wants his total wealth (i.e., human capital plus financial capital) to have a 45% stock allocation. If human capital is assumed to be 30% stock-like, what is the optimal allocation for the financial capital of George, John, and Sam?

⁴ Based on data obtained from the US Bureau of Economic Analysis.

Person	Human Capital (HC)	Financial Capital (FC)	Total Wealth (TW)
George	\$500,000	\$150,000	\$650,000
John	\$800,000	\$300,000	\$1,100,000
Sam	\$150,000	\$150,000	\$300,000

Solution:

The allocation is as follows:

	(A)	(B)	(C)	(D)
	TW × 45%	HC × 30%	(A) – (B)	(C)/FC
Person	Target Equity	HC Equity	FC Equity	FC Equity Allocation %
George	\$292,500	\$150,000	\$142,500	95.00%
John	\$495,000	\$240,000	\$255,000	85.00%
Sam	\$135,000	\$45,000	\$90,000	60.00%

Even within an occupation, each individual has different human capital risks. For example, two people may have the exact same job, but because of random market forces, one could lose his or her job and be unable to find suitable reemployment for an extended period of time. Many financial services workers lost their jobs during the global financial crisis of 2008–2009, and many who became unemployed have been forced to change careers given the lack of available openings. This outcome could have a significant impact on their long-term human capital. Alternatively, a person may have a health shock that seriously reduces their ability to rent his or her human capital for the same wage rate as before. Health shocks that meet the threshold of disability may be partially hedged through the insurance market, and the impact of job loss can be partially hedged through unemployment insurance. Most human capital volatility (other than premature death), however, is difficult to hedge through the insurance market.

If both spouses are employed, this may reduce the overall riskiness of the household's human capital. Each spouse provides his or her own income, each with its own risks, but unless the human capital of the two spouses is highly correlated (e.g., if they are both employed in the same family business), their combined human capital will benefit from diversification. An individual who receives income from numerous sources—such as salaries from different jobs, as well as dividends, interest, and so on—must consider the characteristics of his or her total compensation.

A lower-earning partner may also have a more risky human capital value if the higher-earning partner is tied to a specific geographic location. In the event of a job loss, this household may suffer a more significant decline in human capital value than a household in which both partners are able to move to a location where they can maximize their wage rate. The human capital of a less mobile household will have a lower present value and greater volatility. If human capital is very employer-specific (if the individual would have trouble earning the same wage from a different employer), then it is also less valuable and more risky. A household with a non-working spouse may be in a less vulnerable position than a single-person household if the non-working spouse can exercise the option to rejoin the workforce if the primary earner suffers an unexpected loss in earnings.

Most of the wealth an investor holds outside the investment portfolio (e.g., human capital and defined benefit pensions) tends to be relatively conservative in nature (i.e., more bond-like than stock-like). After an optimal investment policy is determined

that establishes a target mix of risky and risk-free assets based on risk tolerance, the total wealth asset allocation should be adjusted as the value of the assets changes over time. For example, younger investors should likely allocate more of their investment portfolio to stocks because the value of human capital (which is bond-like) is highest early in the life cycle. Conversely, older investors should shift more of their wealth toward bonds because their bond-like human capital is gradually depleted as they approach retirement. This investment strategy is consistent with such life-cycle investments as target-date funds (in which the target date is the expected retirement date of the individual), which gradually increase the allocation to bonds as investors get closer to retirement.

The economic (holistic) balance sheet discussed earlier in the reading considers the current value of marketable and non-marketable assets. However, this type of balance sheet does not consider the stochastic nature of each individual asset or how the value of one asset rises and falls with respect to other assets within the portfolio over time. It also does not consider the relative liquidity of each asset category, which can be particularly important when there are limited financial instruments that can be used, for example, to borrow against the value of a pension. The allocation for the financial portfolio should be coordinated with the risk associated with the non-marketable assets in an investor's portfolio, such as human capital. Using this perspective, the financial portfolio can be considered a completion or hedge portfolio, because it is invested in such a way as to optimize the overall risk characteristics of an individual's total wealth.

Human capital is a unique asset class in a number of ways. First, it can require a continued investment in knowledge and skills to maintain or increase its value. Some professions are more risky than others and will provide either greater income variance or income that is more strongly correlated with systematic risks (i.e., will rise and fall with economic cycles). Some forms of human capital are more vulnerable to disability risks or premature death. A precision welder may earn the same income as an accountant, but the welder may be more vulnerable to an injury that would sharply reduce the value of that human capital. Human capital is also more illiquid, and there are limited financial instruments available that can be used to effectively borrow against expected human capital when earnings fall below a desired level of consumption. Some occupations will have an earnings path that is likely to keep pace with inflation, whereas other occupations will not. Employees in some occupations may have invested in human capital that allows them to be very productive in a specific role for their employer. This heavy investment in employer-specific human capital may not easily be rented to another employer for the same wage rate. This places the employee at greater risk of future income volatility. Many who enjoyed steady income growth in the past—for example, mortgage brokers in the United States during the 2000s—were not fully aware of their own human capital risk. Similarly, individuals who work in the real estate industry should likely seek to underweight real estate assets in their portfolios to reduce exposure to real estate from a total wealth perspective. This diversification may be a challenge for those who carry optimistic beliefs about the future growth of their own industry, but history shows that few industries are immune to market shocks.

EXAMPLE 15

Human Capital and Asset Allocation (2)

Describe how investment strategies can be modified to account for human capital risk.

Solution:

Investment assets may be strongly or weakly correlated with the human capital value of a worker. The overall volatility of one's economic balance sheet can be reduced by selecting assets that correlate weakly (or even negatively) with human capital. Sector investments may be particularly valuable if they are not a complement to the industry that employs the primary earner. Workers with more volatile assets may also prefer more liquid investments.

EXAMPLE 16

Human Capital and Asset Allocation (3)

Compare investment planning for a young family with investment planning for a newly retired couple.

Solution:

A younger household will hold most of its wealth in human capital. For most households, human capital is a bond-like asset that returns a relatively stable income over time. This fact increases the optimal allocation to risky assets within the investment portfolio for younger households. For a newly retired couple, the value of human capital declines relative to the value of the investment portfolio. To balance the total risk of the older household's portfolio, investment portfolio risk should be reduced because investment assets are a larger share of the economic balance sheet (ignoring the impact of charitable bequests and other obligations).

5.4 Asset Allocation and Risk Reduction

An individual or household manages wealth risk mainly to smooth spending over time. A strategy that combines appropriate investments with insurance products, or other risk management tools, can be used to provide the highest level of spending for the level of risk the individual or household is willing to take. Each household will have its own risks and preferences that determine which strategy makes sense.

Investment risk, property risk, and human capital risk can be either idiosyncratic or systematic. Idiosyncratic risks include the risks of a specific occupation, the risk of living a very long life or experiencing a long-term illness, and the risk of premature death or loss of property. Within a total wealth framework, idiosyncratic human capital risks are reduced through investment portfolio strategies and/or through insurance (or annuity) products. Pooling risk allows a household to efficiently reduce idiosyncratic risk. Systematic risks affect all households. For example, a diversified investment portfolio of risky assets will be exposed to the systematic risk that the overall market will fall in value. Earnings can also be affected by systematic risk through a recession or slow economic growth. A cure for cancer might increase overall longevity, placing all households at greater risk of outliving their assets.

The first step in creating strategies for asset allocation and risk reduction is to identify idiosyncratic risk exposures that can be efficiently reduced through diversification or hedging. A young doctor with two children and a lower-earning spouse bears a number of idiosyncratic risks. First, the couple's investment portfolio should be well diversified and not highly correlated with the doctor's income. Second, the household's largest asset, its human capital, could be diminished or lost through disability or premature death. Life insurance and disability insurance provide a hedge

that pools idiosyncratic human capital risk. Medical malpractice insurance provides protection against idiosyncratic liability risk. In general, hedging these risks trades a small drop in expected wealth for an increase in the likelihood of smooth spending.

Young households may have additional liquidity constraints that will affect recommended products. A doctor who expects his or her earnings to rise sharply and who has high current expenses may choose to defer retirement saving for a few years. This individual should not, however, avoid paying premiums on insurance used to hedge the value of human capital. Term life insurance can provide ample coverage at a modest price, and the household may consider a longer elimination period on disability insurance to fit the cost into the current budget. The investment portfolio allocation may be of little consequence because the value of the total wealth portfolio consists almost entirely of human capital. Instead, investments may be selected to increase liquidity that can be used to protect current consumption from any short-term income shock.

A 60-year-old couple nearing retirement with grown, independent children and a large investment portfolio will face a different set of risks. Although their combined income may be higher than that of the young doctor, the value of their human capital is far less if they plan to retire in five years. Therefore, for the older couple, risks to the investment portfolio are far more relevant than human capital risks. Life insurance may have value only as a means of covering estate planning and liquidity needs. Disability insurance can likely be dropped. Health and liability remain significant idiosyncratic risk exposures that can be efficiently reduced through health, long-term care, and liability insurance. Home equity can be protected through property insurance; the risk of idiosyncratic regional real estate price variation should also be considered. The couple's risk of outliving their assets can be protected through the purchase of annuities. Market risk can be particularly important because, compared with a younger household, the older couple's investments are a far larger share of total household wealth. An older household may have fewer liquidity constraints and thus more flexibility to retain risks—for example, through higher insurance deductibles and longer elimination periods on long-term care insurance. This older household may also choose to retain the majority of property risk. A rational increase in risk retention can be combined with a reduction in portfolio risk to achieve an efficient balance of total wealth risk. The household will receive a higher expected return (equal to the insurance load) from accepting greater insurable risk while simultaneously reducing the expected return on the investment portfolio by increasing the share of safe assets.

Human capital risks are correlated with market returns and can be at least partially hedged through holistic portfolio construction. Consider a 50-year-old couple, Jennifer and Wade. Jennifer earns US\$75,000 a year working as a tenured college professor, and Wade earns US\$100,000 selling drilling parts to the oil industry. Jennifer participates in the state public employee pension system, which is currently in good enough financial condition to cover promised benefits for the next 40 years. Wade has US\$300,000 saved in a 401(k), half in employer stock. Both are eligible to receive Social Security benefits.

Wade works in a cyclical industry and will see high variability in income but a modest covariance of earnings with the performance of the overall stock market. Although Wade's income today is higher than Jennifer's income, the difference in the present value of their human capital will not be that great. Wade's income is more volatile because it rests largely on the strength of the domestic oil industry. Jennifer may apply a discount rate equivalent to that of current state government bonds because her salary is unlikely to change and her salary risk is comparable to the state's ability to pay general obligation debts. The discount rate on Wade's income may be placed above the historical equity premium because his human capital risk is not easily diversified and is more volatile than the market in general.

To preserve consumption if Wade is laid off for a period of time, the couple should consider holding a significant amount of assets in marketable securities that can be easily liquidated to fund short-term spending needs. These types of assets include money market accounts and short-term government bonds, which can be easily traded in the secondary market. Investment assets held in taxable accounts can be accessed for emergency spending in the event of long-term unemployment. The combination of Jennifer's stable salary and Wade's volatile income allows the couple to take on greater risk than if they lived on Wade's income alone. If Wade and Jennifer have an average level of investment risk tolerance, then they should invest in a mix of stocks and bonds, each within the most tax-efficient account, to create a balanced portfolio appropriate to the couple's risk preferences and the risk of the remainder of the total wealth portfolio.

Wade's more risky human capital is highly correlated with the overall economy, although as previously mentioned, his wages are likely not strongly correlated with the equity market in general. A more efficient investment portfolio will provide a partial hedge against Wade's idiosyncratic human capital risk. The obvious first step would be to sell Wade's investments in employer stock. This may be complicated by restrictions on selling the stock or even Wade's subjective opinion of the potential value of his employer's stock. If Wade is restricted from selling his company stock, an adviser might suggest put options to hedge this risk. To balance the risk to Wade's human capital, the retirement portfolio should overweight sector funds that are either uncorrelated or negatively correlated with the oil industry. Sectors, such as transportation, that perform well when oil prices fall will provide some buffer against fluctuations in the value of Wade's human capital.

The value of Jennifer's pension will likely be a significant share of the couple's total wealth. Discounted at a modest bond rate of comparable duration to the expected pension payments, the value of her pension likely exceeds the US\$300,000 that John has saved in his 401(k). If her pension were less secure, which can be estimated based on the percentage of future obligations that can be funded from current assets, then the pension would be discounted at a higher rate. Jennifer's pension can be viewed as a forced savings plan with a promised stable future payout that is comparable to a bond. If the discounted value is estimated to be US\$500,000, then this portion of the total portfolio will be characterized as a bond-like asset. Couples with significant pension assets can accept greater risk in the rest of their investment portfolio because poor risky asset performance has less of an impact on future spending when the bulk of consumption will be funded from stable pension income. Wade can take greater risk in his 401(k) because the couple will be able to rely on Jennifer's pension. Note that although it is often difficult to consider, the possibility of divorce should also affect recommendations if pension assets are not allocated to the other spouse. For example, couples may want to hold greater liquidity, and spouses with defined contribution savings or more volatile human capital may choose to take less investment risk.

EXAMPLE 17

Asset Allocation and Risk Reduction

Consider two 35-year-old couples, each of which earns a combined US\$150,000 per year. One couple consists of an individual who is employed as a petroleum engineer and a non-working spouse. The other couple consists of two high school teachers. Compare asset allocation and risk reduction strategies for each couple.

Solution:

The human capital value of the couple consisting of the petroleum engineer and the non-working spouse is likely lower than the combined human capital value of the high school teachers, although the combined lifetime cumulative wages of the teachers is likely lower than those of the engineer and the spouse. Earnings for the engineer are highly correlated with oil prices, and either rising or falling prices will affect the household's available income in the future. The impact of a disability on employability may be more severe for the engineer than for a teacher. The engineer should thus likely consider a less risky portfolio and should overweight securities that have a low correlation with oil prices. Conversely, the teachers should select a riskier portfolio as a result of their higher human capital and low correlation with individual market sectors.

SUMMARY

The risk management process for individuals is complex given the variety of potential risks that may be experienced over the life cycle and the differences that exist across households. In this reading, key concepts related to risk management and individuals include the following:

- The two primary asset types for most individuals can be described broadly as human capital and financial capital. Human capital is the net present value of the individual's future expected labor income, whereas financial capital consists of assets currently owned by the individual and can include such items as a bank account, individual securities, pooled funds, a retirement account, and a home.
- Economic net worth is an extension of traditional balance sheet net worth that includes claims to future assets that can be used for consumption, such as human capital, as well as the present value of pension benefits.
- There are typically four key steps in the risk management process for individuals: Specify the objective, identify risks, evaluate risks and select appropriate methods to manage the risks, and monitor outcomes and risk exposures and make appropriate adjustments in methods.
- The financial stages of life for adults can be categorized in the following seven periods: education phase, early career, career development, peak accumulation, pre-retirement, early retirement, and late retirement.
- The primary goal of an economic (holistic) balance sheet is to arrive at an accurate depiction of an individual's overall financial health by accounting for the present value of all available marketable and non-marketable assets, as well as all liabilities. An economic (holistic) balance sheet includes traditional assets and liabilities, as well as human capital and pension value, as assets and includes consumption and bequests as liabilities.
- The total economic wealth of an individual changes throughout his or her lifetime, as do the underlying assets that make up that wealth. The total economic wealth of younger individuals is typically dominated by the value of their human capital. As individuals age, earnings will accumulate, increasing financial capital.

- Earnings risk refers to the risks associated with the earnings potential of an individual—that is, events that could negatively affect someone’s human and financial capital.
- Premature death risk relates to the death of an individual, such as a family member, whose future earnings (human capital) were expected to help pay for the financial needs and aspirations of the family.
- Longevity risk is the risk of reaching an age at which one’s income and financial assets are insufficient to provide adequate support.
- Property risk relates to the possibility that one’s property may be damaged, destroyed, stolen, or lost. There are different types of property insurance, depending on the asset, such as automobile insurance and homeowner’s insurance.
- Liability risk refers to the possibility that an individual or other entity may be held legally liable for the financial costs of property damage or physical injury.
- Health risk refers to the risks and implications associated with illness or injury. Health risks manifest themselves in different ways over the life cycle and can have significant implications for human capital.
- The primary purpose of life insurance is to help replace the economic value of an individual to a family or a business in the event of that individual’s death. The family’s need for life insurance is related to the potential loss associated with the future earnings power of that individual.
- The two main types of life insurance are temporary and permanent. Temporary life insurance, or term life insurance, provides insurance for a certain period of time specified at purchase, whereas permanent insurance, or whole life insurance, is used to provide lifetime coverage, assuming the premiums are paid over the entire period.
- Fixed annuities provide a benefit that is fixed (or known) for life, whereas variable annuities have a benefit that can change over time and that is generally based on the performance of some underlying portfolio or investment. When selecting between fixed and variable annuities, there are a number of important considerations, such as the volatility of the benefit, flexibility, future market expectations, fees, and inflation concerns.
- Among the factors that would likely increase demand for an annuity are the following: longer-than-average life expectancy, greater preference for lifetime income, less concern for leaving money to heirs, more conservative investing preferences, and lower guaranteed income from other sources (such as pensions).
- Techniques for managing a risk include risk avoidance, risk reduction, risk transfer, and risk retention. The most appropriate choice among these techniques often is related to consideration of the frequency and severity of losses associated with the risk.
- The decision to retain risk or buy insurance is determined by a household’s risk tolerance. At the same level of wealth, a more risk-tolerant household will prefer to retain more risk, either through higher insurance deductibles or by simply not buying insurance, than will a less risk-tolerant household. Insurance products that have a higher load will encourage a household to retain more risk.

- An individual's total economic wealth affects portfolio construction through asset allocation, which includes the overall allocation to risky assets, as well as the underlying asset classes, such as stocks and bonds, selected by the individual.
- Investment risk, property risk, and human capital risk can be either idiosyncratic or systematic. Examples of idiosyncratic risks include the risks of a specific occupation, the risk of living a very long life or experiencing a long-term illness, and the risk of premature death or loss of property. Systematic risks affect all households.

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PRACTICE PROBLEMS

The following information relates to Questions 1–8

Richard Lansky is an insurance and wealth adviser for individuals. Lansky's first meeting of the day is with Gregory Zavis, age 27, a new client who works as a journalist. Gregory's only asset is \$5,000 in savings; he has \$67,000 in liabilities. During the conversation, Lansky describes the concepts of financial capital and human capital, as well as the components of economic and traditional balance sheets. Gregory asks Lansky:

On which balance sheet are my future earnings reflected?

Gregory does not have medical insurance. He asks Lansky for advice regarding a policy that potentially would allow him to avoid paying for office visits related to minor medical problems.

In the afternoon, Lansky meets with Gregory's parents, Molly and Kirk, ages 53 and 60. Molly is a tenured university professor and provides consulting services to local businesses. Kirk is a senior manager for an investment bank. Lansky determines that Molly's income is more stable than Kirk's.

Kirk and Molly discuss estate planning, and Lansky recommends a whole life insurance policy on Kirk's life, with Molly responsible for paying the premiums. In the event of Kirk's death, Gregory would be entitled to the proceeds from the policy. Lansky explains that one feature of the policy provides for a portion of the benefits to be paid even if a premium payment is late or missed.

Molly tells Lansky that she has recently been reading about annuities and would like to clarify her understanding. Molly makes the following statements.

- Statement 1 Both deferred and immediate annuities provide the same flexibility concerning access to invested funds.
- Statement 2 The income yield for a given amount invested in a life-only immediate annuity is higher for an older person than for a younger person.

At the end of the consultation, Molly asks Lansky for advice regarding her retired aunt, Rose Gabriel, age 69. Molly believes that Gabriel's life annuity and pension benefits will provide enough income to meet her customary lifestyle needs. Gabriel lives in her mortgage-free home; her medical insurance plan covers basic health care expenses. Women in Gabriel's family generally have long life spans but often experience chronic health problems requiring extended nursing at home. Therefore, Molly is concerned that medical expenses might exceed Gabriel's net worth during her final years.

- 1 Gregory's human capital is:
 - A lower than his financial capital.
 - B equal to his financial capital.
 - C higher than his financial capital.
- 2 The *most* appropriate response to Gregory's balance sheet question is:
 - A the economic balance sheet only.
 - B the traditional balance sheet only.

- C both the economic and the traditional balance sheets.
 - 3 Given Gregory's policy preference, which type of medical insurance should Lansky recommend?
 - A Indemnity plan
 - B Preferred provider plan
 - C Health maintenance organization plan
 - 4 In estimating Molly's human capital value, Lansky should apply an income volatility adjustment that is:
 - A less than Kirk's.
 - B the same as Kirk's.
 - C greater than Kirk's.
 - 5 Regarding the whole life insurance policy recommended by Lansky, Kirk would be the:
 - A owner.
 - B insured.
 - C beneficiary.
 - 6 The whole life insurance policy feature described by Lansky is a:
 - A non-forfeiture clause.
 - B waiver-of-premium rider.
 - C guaranteed insurability rider.
 - 7 Which of Molly's statements about annuities is/are correct?
 - A Statement 1 only
 - B Statement 2 only
 - C Both Statement 1 and Statement 2
 - 8 The type of insurance that will *best* address Molly's concern about Gabriel is:
 - A disability insurance.
 - B longevity insurance.
 - C long-term care insurance.
-

The following information relates to Questions 9–15

Henri Blanc is a financial adviser serving high-net-worth individuals in the United States. Alphonse Perrin, age 55, meets with Blanc for advice about coordinating his employee benefits with his investment and retirement planning strategies.

Perrin has adopted a life-cycle portfolio strategy and plans to retire in 10 years. Recently, he received a promotion and \$50,000 salary increase to manage a regional distribution center for a national retail firm. Perrin's spending needs are currently less than his annual income, and he has no debt. His investment assets consist of \$2,000,000 in marketable securities (90% equity/10% fixed income) and a vineyard with winery valued at \$1,500,000.

Blanc leads Perrin through a discussion of the differences between his financial capital and his human capital, as well as between his traditional balance sheet and his economic balance sheet. Perrin is vested in a defined benefit pension plan based

on years of service and prior salary levels. Future benefits will vest annually based on his new salary. Perrin makes the following statements regarding his understanding of pension benefits.

- Statement 1 Unvested pension benefits should be classified as human capital.
- Statement 2 Vested pension benefits should not be classified as financial capital until payments begin.

Perrin asks Blanc to compare his traditional and economic balance sheets. Blanc calculates that the sum of the present values of Perrin's consumption goals and bequests exceeds that of his unvested pension benefits and future earnings.

Perrin tells Blanc that he expects a slower rate of growth in the US economy. Perrin expresses the following concerns to Blanc.

- Concern 1** Holding all else equal, I wonder what the effect will be on my human capital if the nominal risk-free rate declines?
- Concern 2** My employer projects a slower rate of sales growth in my region; therefore, I am anxious about losing my job.

Perrin is a widower with three adult children who live independently. Perrin's oldest son wishes to inherit the vineyard; the two other children do not want to be involved. Perrin would like to accommodate his children's wishes; however, he wants each child to inherit equal value from his estate. Blanc explains potential uses of life insurance to Perrin and suggests that one of these uses best meets Perrin's immediate needs.

Perrin expresses a preference for a life insurance policy that provides a range of investment options. Perrin selects a policy and asks Blanc to calculate the net payment cost index (per \$1,000 of face value, per year), using a life expectancy of 20 years and a discount rate of 5%. Table 1 provides information about Perrin's policy.

Table 1 Perrin's Life Insurance Policy

Face value	\$500,000
Annual premium (paid at beginning of the year)	\$12,000
Policy dividends anticipated per year (paid at end of the year)	\$2,000
Cash value projected at the end of 20 years	\$47,000

- 9 Which of Perrin's statements regarding his pension is/are correct?
 - A Statement 1 only
 - B Statement 2 only
 - C Both Statement 1 and Statement 2
- 10 Blanc's calculations show that Perrin's economic net worth is:
 - A less than his net worth.
 - B equal to his net worth.
 - C greater than his net worth.
- 11 In response to Perrin's Concern #1, human capital will *most likely*:
 - A decrease.
 - B remain the same.
 - C increase.
- 12 Perrin's Concern #2 identifies a risk related to:
 - A human capital only.

- B financial capital only.
 - C both human and financial capital.
- 13 Which of the following uses of life insurance *best* meets Perrin's immediate needs?
- A Provides estate liquidity
 - B Acts as a tax-sheltered savings instrument
 - C Replaces lost earning power for dependents
- 14 The type of life insurance *most appropriate* for Perrin is:
- A term.
 - B universal.
 - C whole life.
- 15 The net payment cost index that Blanc should calculate is *closest* to:
- A \$17.48.
 - B \$20.00.
 - C \$20.19.

The following information relates to Questions 16–23

Adrian and Olivia Barksdale live in Australia with their 16-year-old twins. Adrian, 47, works in a highly cyclical industry as an engineering manager at a bauxite mine. Olivia, 46, is an accountant. The Barksdales are saving for their retirement and college funding for both children. Adrian's annual salary is A\$190,000; Olivia's annual salary is A\$85,000. The family's living expenses are currently A\$95,000 per year.

Both Adrian and Olivia plan to work 18 more years, and they depend on their combined income and savings to fund their goals. The Barksdales' new financial adviser, Duncan Smith, recommends an appropriate disability insurance policy to cover Adrian, given his large salary. Because he has a highly specialized job, Adrian is willing to pay for the most comprehensive policy available.

Smith is also concerned about the Barksdales' existing life insurance coverage. Currently, the Barksdales have a term life policy insuring Adrian with a death benefit of A\$100,000. Smith assesses the family's insurance needs in the event Adrian were to die this year. To do so, Smith uses the needs analysis method based on the financial data presented in Exhibit 1 and the following assumptions:

- The discount rate is 6.0%, and the tax rate is 30%.
- Salary and living expenses grow at 3.5% annually.
- Salary and living expenses occur at the beginning of each year.
- The following assumptions apply in the event of Adrian's death:
 - Olivia will continue to work until retirement;
 - Family living expenses will decline by \$30,000 per year;
 - Olivia's projected living expense will be \$50,000 per year for 44 years; and
 - The children's projected living expenses will be \$15,000 per year for 6 years.

Exhibit 1 Barksdale Family Financial Needs Worksheet

Cash Needs	AUD (A\$)
Final expenses and taxes payable	20,000
Mortgage retirement	400,000
Education fund	300,000
Emergency fund	30,000
Total cash needs	750,000
Capital Available	
Cash and investments	900,000
Adrian: Life insurance	100,000
Total capital available	1,000,000

Next, Smith discusses the advantages and disadvantages of annuities. The Barksdales are interested in purchasing an annuity that offers the following characteristics:

- a payout that begins at retirement,
- the ability to invest in a menu of investment options, and
- a payout that continues as long as either Olivia or Adrian is living.

Olivia's mother, Sarah Brown, is also a client of Smith. She is age 75 and retired, and she needs a known income stream to assist her with current and future expenses. Brown's parents both lived longer than average, and she is concerned about outliving her assets. Smith recommends an annuity.

The Barksdales also worry about longevity risk given their family history and healthy lifestyle. Both spouses want an annuity for their later years (beginning in 40 years) that will ensure the greatest supplemental, level income stream relative to the cost. The Barksdales are willing to forgo the right to cash out the policy.

Smith turns to a discussion about the Barksdales' investment portfolio and how total economic wealth (human capital plus financial capital) might affect asset allocation decisions. The Barksdales' human capital is valued at \$2.9 million and estimated to be 35% equity-like. Smith determines that an overall target allocation of 40% equity is appropriate for the Barksdales' total assets on the economic balance sheet.

Smith makes two recommendations regarding the Barksdales' investment portfolio.

- Recommendation 1** The portfolio should have lower risk than a portfolio for similar investors in the same lifestyle stage.
- Recommendation 2** The portfolio should underweight securities having a high correlation with bauxite demand.

- 16** Based on Adrian's job and salary, the *most appropriate* disability policy would define disability as the inability to perform duties of:
- A** any occupation.
 - B** Adrian's regular occupation.
 - C** any occupation for which Adrian is suited by education and experience.
- 17** Based on the given assumptions and the data in Exhibit 1, the additional amount of life insurance coverage needed is *closest* to:
- A** A\$0.
 - B** A\$331,267.

- C A\$2,078,101.
- 18 Based on the Barksdales' annuity preferences, which type of annuity should they purchase?
- A Deferred fixed
 - B Deferred variable
 - C Immediate variable
- 19 Based on the Barksdales' annuity preferences, which annuity payout method should they choose?
- A Joint life annuity
 - B Life annuity with refund
 - C Life annuity with period certain
- 20 Based on Brown's goals and concerns, which type of annuity should Smith recommend for her?
- A Deferred fixed
 - B Immediate fixed
 - C Immediate variable
- 21 Which type of annuity *best* satisfies the Barksdales' desire for supplemental income in their later years?
- A Deferred fixed
 - B Deferred variable
 - C Advanced life deferred
- 22 Based on Exhibit 1, and meeting the Barksdales' target equity allocation for total economic wealth, the financial capital equity allocation should be *closest* to:
- A 35.0%.
 - B 54.5%.
 - C 56.1%.
- 23 Which of Smith's recommendations regarding the Barksdales' investment portfolio is/are correct?
- A Recommendation 1 only
 - B Recommendation 2 only
 - C Both Recommendation 1 and Recommendation 2

SOLUTIONS

- 1 C is correct. Gregory is in the early career stage of life, and human capital represents a large proportion of his total wealth. Gregory is relatively young; therefore, the present value of his expected earnings implies positive human capital. Furthermore, Gregory's savings are rather low, so his financial capital is small. Consequently, his human capital is greater than his financial capital.
- 2 A is correct. The present value of expected future earnings is reflected on an economic balance sheet but not on a traditional balance sheet.
- 3 C is correct. A health maintenance organization plan is a type of medical insurance that allows office visits at no, or very little, cost. Gregory would like to avoid paying for office visits related to minor medical problems; hence this alternative is the most appropriate.
- 4 A is correct. The income volatility adjustment reflects the fact that income from different professions can vary significantly. Molly works in an industry that has low correlation with the capital markets; she also earns income from an additional source. Kirk works in an industry that has high correlation with capital markets, and so he might experience higher income variability than Molly. Consequently, in estimating Molly's human capital, the income volatility adjustment for Molly should be lower than Kirk's.
- 5 B is correct. The policy would be on Kirk's life; his death would trigger the insurance payment. Therefore, Kirk would be the insured.
- 6 A is correct. The whole life insurance policy feature described is a non-forfeiture clause, whereby there is the option to receive some portion of the benefits if premium payments are missed (i.e., before the policy lapses).
- 7 B is correct. Statement 2 is correct because, all else equal, the income yield is higher when expected longevity is shorter; therefore, the income yield will be higher for an older person.
- 8 C is correct. Molly is concerned about a potential late-life medical condition that may require extended home care for Gabriel. Long-term care insurance is designed to cover a portion of the cost of home care, assisted living facilities, and/or nursing home expense. Gabriel has enough resources to cover her living expenditures, but her medical insurance might be insufficient to cover the costs of extended home care, medicine, or hospital stays. Consequently, long-term care insurance is the most appropriate insurance choice given Gabriel's situation.
- 9 A is correct. Unvested pension benefits are typically contingent on future work and are thus considered to be part of human capital. Statement #2 is incorrect: vested pension benefits can be considered components of financial capital.
- 10 A is correct. Economic net worth is calculated as follows:

$$\text{Economic net worth} = \text{Net worth from the traditional balance sheet} + (\text{Present value of future earnings} + \text{Present value of unvested pension benefits}) - (\text{Present value of consumption goals} + \text{Present value of bequests})$$

Perrin's economic net worth is less than his net worth because the sum of the present values of consumption and bequests is greater than the sum of the present values of future earnings and unvested pensions.

- 11 C is correct. Human capital, HC_0 , is calculated as follows:

$$HC_0 = \sum_{t=1}^N \frac{p(s_t)w_{t-1}(1 + g_t)}{(1 + r_f + y)^t}$$

Holding all else equal as Perrin directs, a reduction in the nominal risk-free rate, r_f , would decrease the total discount rate, thus increasing the present value of human capital.

- 12 C is correct. The projected slowdown in his employer's sales growth may result in Perrin's unemployment, indicating that he may be subject to earnings risk. Human capital would be reduced by the loss of future earnings and halt accrual of pension benefits at Perrin's present employer. Financial capital could also be affected because assets may need to be sold to make up for any loss of income.
- 13 A is correct. Life insurance best meets Perrin's immediate need for estate liquidity. A life insurance policy can provide liquidity without the delay involved in the legal process of settling the estate. This liquidity can be particularly valuable if the estate contains illiquid assets or assets that are difficult to separate and distribute equitably among heirs. Currently, it would be difficult to separate and equitably distribute Perrin's financial assets to his three children such that the oldest son inherits the vineyard and winery while keeping the other two children uninvolved because the business is worth more than one-third of Perrin's investment assets. The problem of separating and equitably distributing the estate exists presently regardless of the value of Perrin's personal property.
- 14 B is correct. Perrin's estate distribution plan indicates a need for estate liquidity funded by permanent insurance that can remain in force until his death. Perrin prefers a policy that offers a range of investment options. Universal life is thus most appropriate because it is a form of permanent insurance that can remain in force until Perrin's death and typically has more options for investing the cash value than do whole life policies.
- 15 C is correct. The net payment cost index assumes that the insured will die at the end of a specified period—in this case, the given life expectancy of 20 years. Calculating the net payment cost index includes the following steps.

Future value of premiums (annuity due, 5%, 20 years)	\$416,631.02
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Financial calculator operations:

$N = 20, I = 5, PV = 0, PMT = -12,000, \text{mode} = \text{begin}; FV \rightarrow 416,631.02$

Future value of dividends (ordinary annuity, 5%, 20 years)	(\$66,131.91)
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$N = 20, I = 5, PV = 0, PMT = 2,000, \text{mode} = \text{end}; FV \rightarrow -66,131.91$

20-Year insurance cost	\$350,499.11
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Annual payments for insurance cost (annuity due, 5%, 20 years)	(\$10,095.24)
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$N = 20, I = 5, PV = 0, FV = 350,499.11, \text{mode} = \text{begin}; PMT \rightarrow -10,095.24$

Net payment cost index (\$10,095.24/500)	(\$20.19)
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- 16 B is correct. The most comprehensive policy would define disability as the inability to perform Adrian's regular occupation. For professionals with specialized skills, policies that use regular occupation are generally preferred even though they are more expensive. Mr. Barksdale works in a specialized, high-paying occupation, and the family depends on his income.
- 17 B is correct. The additional amount of life insurance coverage needed is calculated as the difference between the family's total financial needs and total capital available.

Total financial needs are calculated as follows.

Cash Needs	AUD (A\$)
Final expenses and taxes	20,000
Mortgage retirement	400,000
Education fund	300,000
Emergency fund	30,000
Total cash needs	750,000

Capital Needs	Present Value
Olivia's living expenses, 44 years	1,377,175
Children's living expenses, 6 years	84,848
(Olivia's income, 18 years)	–880,756
Total capital needs	581,267
Total financial needs	1,331,267

Capital needs are determined as the present value of an annuity due: growth rate = 3.5%, discount rate = 6.0%. Growth of payments is incorporated by adjusting the discount rate to account for the growth rate of earnings. As long as the discount rate is larger than the growth rate, the adjusted rate i can be calculated as follows: $[(1 + \text{Discount rate})/(1 + \text{Growth rate})] - 1$, or $i = (1.06/1.035) - 1 = 2.42\%$.

The present value of Olivia's living expenses is calculated as follows:

$$\text{PMT} = -\$50,000; i = 2.42\%, n = 44. \text{ Set for payments at beginning of year.} \\ \text{PV} = \$1,377,175.$$

The present value of the children's living expenses is calculated as follows:

$$\text{PMT} = -15,000; i = 2.42\%, n = 6. \text{ Set for payments at beginning of year.} \\ \text{PV} = \$84,848.$$

The present value of Olivia's income is calculated as follows:

$$\text{PMT} = -\$85,000 \times (1 - \text{Tax rate}); \text{PMT} = \$85,000 \times 0.70 = 59,500; i = 2.42\%, \\ n = 18. \text{ Set for payments at beginning of year.} \text{PV} = -\$880,756.$$

Total capital needs are calculated as follows:

$$\$1,377,175 + \$84,848 - \$880,756 = \$581,267. \text{ Adding this amount to total} \\ \text{cash needs of \$750,000 results in total financial needs of \$1,331,267.}$$

The total capital available is calculated as follows.

Capital Available	AUD (A\$)
Cash and investments	900,000
Current life insurance	100,000
Total capital available	1,000,000

The additional life insurance need is calculated as follows.

Total financial needs	1,331,267
Total capital available	1,000,000
Life insurance shortfall (excess)	331,267

- 18** B is correct. The Barksdales want an annuity with a deferred payout (beginning at retirement) and an ability to invest in a diversified mix of securities. Most deferred variable annuities offer a diversified menu of potential investment options, whereas a fixed annuity locks the annuitant into a portfolio of bond-like assets at whatever rate of return exists at the time of purchase.
- 19** A is correct. A joint life annuity best addresses the Barksdales' goal of receiving a payout as long as either of them is alive. Under a joint life annuity, two or more individuals, such as a husband and a wife, receive payments until all beneficiaries die.
- 20** B is correct. With immediate fixed annuities, Brown will trade a sum of money today for a promised income benefit for as long as she is alive. Brown is already age 75 and is concerned about longevity risk; she wants a known income stream currently and in the future. Therefore, an immediate fixed annuity is the most appropriate choice.
- 21** C is correct. In contrast to an immediate payout annuity, an advanced life deferred annuity's (ALDA's) payments begin later in life—for example, when the individual turns 80 or 85. An ALDA would provide the greatest supplemental level income relative to the cost because the payments are made far in the future, life expectancy is shorter when the payments begin, and some policyholders will die without receiving payments.
- 22** C is correct. The equity allocation of the Barksdale's financial capital is calculated as follows:

$$\text{Total economic wealth} = \text{Human capital} + \text{Financial capital} = \$2,900,000 + \$900,000 = \$3,800,000.$$

$$\text{Target equity allocation of total economic wealth} = \$3,800,000 \times 40\% = \$1,520,000$$

$$\text{Human capital equity allocation} = \$2,900,000 \times 35\% = \$1,015,000$$

$$\text{Financial capital equity allocation} = \$1,520,000 - \$1,015,000 = \$505,000$$

$$\begin{aligned} \% \text{ Financial capital equity allocation} &= \text{Financial equity allocation} / \text{Total financial capital} \\ &= \$505,000 / \$900,000 \\ &= 0.5611, \text{ or } 56.1\% \end{aligned}$$

- 23** C is correct. People with higher risk and potential volatility in income (human capital) should take on lower risk in their investment portfolios. Adrian's income is more than two-thirds of the household total and is somewhat volatile because of cyclical demand for his employer's product. Additionally, because income is tied to a particular industry or sector, the Barksdales should underweight securities having a high correlation with bauxite demand.