

2020 年 12 月 CFA 三级百题预测（下）

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1. SS3 Behavioral Finance

Case 1: Green

Doug Green is a Professor of Finance at a major university. Elizabeth Weaver is a Managing Director at Gates Investment Management. Gates focuses exclusively on high net worth clients with assets over \$10 million dollars. Green and Weaver are panelists at an investment conference contrasting traditional finance with behavioral finance.

In Green's opening remarks, he discusses how traditional finance drives investment decision making. He explains that traditional finance is grounded in neoclassical economics and is normative, indicating how people and markets should behave. Green comments that individuals are assumed to be risk-averse, rational investors, who are self-interested utility maximizers. He concludes with the following three statements regarding traditional finance:

Statement 1 Market prices reflect all available and relevant information;

Statement 2 Investors have access to perfect information; and

Statement 3 Investors process all available information based on their own experiences.

Weaver's opening remarks focus on the impact of behavioral finance on our understanding of investment decision-making. She explains behavioral finance is largely grounded in psychology and attempts to understand and explain observed investor and market behaviors. Weaver states she sees the impact of behavioral finance every day and notes individuals are neither perfectly rational nor irrational. She challenges the validity of the rational economic man (REM) on the basis that it disregards the inner conflicts that people face and the limitations of individuals in making decisions.

Green moves on to discuss Utility Theory by stating people maximize the present value of utility subject to the present value of their budget constraints. He explains utility can be thought of as the level of relative satisfaction received from the consumption of goods and services. Green adds that decision makers choose between prospects by comparing their expected utility values. He stresses it is important to remember that the determination of value is based on price. Green remarks there are four axioms of utility theory and if a decision maker satisfies the four axioms, they are said to be rational.

Weaver responds to Green's statement by remarking that behavioral finance challenges the assumptions of traditional finance. It also attempts to understand and explain actual investor and market behaviors. She explains that instead of basing its assumptions on idealized behavior, it bases them on observed behavior. She recounts an instance when an elderly client asked her to realize losses in her portfolio to offset taxable realized gains. However, the very next day the same client called her in a panic to ask why her cash balance was so high.

Weaver discusses how decisions are shaped by the decision-making process itself. She provides the following example:

"A new client is interested in becoming an antique car investor and requested I make available \$200,000 from his portfolio so he could start his collection. Shortly after the money was made available, the client visited an antique car auction not far from his home. Unfortunately, the auction had a limited number of cars meeting his requirements. He was drawn to one antique car in particular, even though it was missing several of the features he wanted. After some consideration he decided to purchase it anyway. Within an hour, his purchase was placed in storage for safekeeping."

The final topic of the day was the impact of behavioral finance on capital markets. After a rigorous debate for and against the Efficient Market Hypothesis, Green and Weaver reached the following conclusions:

Conclusion 1 Support exists for both efficient markets and anomalous markets.

Conclusion 2 By understanding investor behavior, the investment solutions that are constructed will be closer to the rational solution provided by traditional finance.

Conclusion 3 If a market is strong form efficient, sophisticated investors may be better positioned to outperform less savvy participants.

1. Which of Green's opening statements is least likely correct regarding traditional finance assumptions?
 - A. Statement 3
 - B. Statement 2
 - C. Statement 1

2. Are Weaver's criticisms concerning the rational economic man (REM) most likely correct?
 - A. Yes.
 - B. No, with regards to the inner conflicts people face.
 - C. No, with regards to limitations in decision-making.

3. What behavior has Weaver's elderly client most likely exhibited?
 - A. Emotional bias
 - B. Bounded Rationality
 - C. Cognitive error

4. What behavior did Weaver's new client most likely demonstrate when he purchased the antique car?
 - A. Satisficing
 - B. Utility maximization

- C. Using heuristics
- 5. Which of Green and Weaver's conclusions regarding market behavior is least likely correct?
 - A. Conclusion 1
 - B. Conclusion 3
 - C. Conclusion 2

Case 2: Philly

Meredith Yang, recently joined Philly Investment Advisors (Philly) located in downtown Philadelphia, USA. Philly is an investment advisory firm focused on managing the assets of high net worth individuals and small institutional clients. Derick Owen, is Yang's supervisor, a member of the firm's Investment Committee, and a senior member of Philly's Client Service team. Yang will be traveling with Owen to meet with the firm's clients and when possible she is expected to attend the firm's daily research meetings and quarterly investment meeting so that she can adequately communicate the firm's investment strategy.

Owen's next meeting is with George Bailey, an entrepreneur and self-made millionaire. Owen and Yang talk prior to the meeting and he makes the following observations: Bailey is independent, strong willed, quick to make decisions, and extremely confident. Historically his portfolio has had a high turnover rate and he has tended to chase higher risk investments. He is also very "hands on." Bailey's youngest child is expected to graduate from university in the next couple of years and he has become increasingly more emotional about his investments. Yang questions if Owen has ever considered a behaviorally modified portfolio for Bailey, even though he demonstrates some of the shortcoming of classifying investors into personality types.

Owen and Yang have lunch with Richard Sloan, a new client, to discuss his Investment Policy Statement (IPS). Upon returning to the office, Yang writes up the following notes from their meeting and include Sloan's comments regarding why he has decided to change investment advisers:

Comment 1 Previous adviser solely focused on outperforming the S&P 500.

Comment 2 Previous adviser provided a consistent approach to managing their relationship.

Comment 3 Previous adviser did not understand him or his financial objectives.

Given Sloan's comments, Yang believes incorporating behavioral finance into his IPS will help to enhance the firm's relationship with him.

Owen and Yang meet with Callie Steven, an upper level executive with AutoPay, a small but fast growing privately held company. She has been employed with AutoPay for more than 15 years and as a result, her holdings in AutoPay are estimated to be more than 30% of her total portfolio. She believes that over the next several years AutoPay will put together an initial public offering, resulting in a huge windfall. She states that she has a significant portion of her portfolio in short-term bonds and money market funds to offset the risk of her AutoPay shares. Owen points out to Steven that her current portfolio is subject to mental accounting, is not constructed in layers, and does not take into consideration covariance between assets.

Amelia Montgomery, Philly's analyst responsible for covering the consumer discretionary sector, attended an investor briefing with the management team for Cole & Garn. Philly's investment committee is particularly interest in Cole & Garn since the stock is held in many of the portfolios

they manage. Montgomery informs the committee that company management provided a favorable summary of the previous year and offered ambitious guidance for future earnings. She reminds the group that management is susceptible to behavioral biases and that they tend to be overconfident with an inclination to overestimate the likelihood of favorable outcomes. She felt that the best way to deal with management biases was to maintain a disciplined and systematic research approach. Remembering her days as a junior analyst, Yang cautioned that discounting management's comments and guidance could be problematic and detrimental to performance.

Philly's investment committee also met with their research analyst that covers the computer hardware industry to discuss the potential purchase of LTop Computers, a leading manufacturer of personal computer and tablets. Philly's research analyst presented his investment recommendation and upgraded his rating on the stock to buy from hold given LTop's new product introductions and an improved earnings outlook. During the discussion, committee chair Jackson Burke commented that he had suffered a major loss in LTop stock in the past so he would not be able to support buying the stock regardless of the improved outlook. There was little further discussion and the remaining committee members supported Burke's view.

Over the next week, Owen and Yang are scheduled to meet with Fillman Associates, Philly's largest institutional client. Owen mentions that Fillman is more sophisticated than Philly's typical client. To prepare for the meeting Yang reviews several of Fillman's annual due diligence forms completed by Owen. One question in particular catches her attention: it asked how the firm's equity portfolios performed during the 2005–2007 residential property boom and how the equity turnover rates varied from previous years when the markets were more efficient. In part, the response read, "During the residential property boom of 2005–2007 equity trading activity was significantly higher than previous years when the markets were more efficient. Our trading expertise allowed us to consistently harvest profits."

1. Based on Owen's observations, which of the following would least likely limit the applicability of behavioral models to Bailey?
 - A. Displaying characteristics of multiple investor types.
 - B. Both cognitive and emotional biases.
 - C. Behavioral changes as he ages.

2. Is Owen's comment regarding Steven's current portfolio correct?
 - A. No, he is incorrect with regard to portfolio construction.
 - B. Yes.
 - C. No, he is incorrect with regard to covariance between assets.

3. What behavioral bias most likely influenced the investment committee members to decide against the purchase of LTop stock?
 - A. Loss Aversion.
 - B. Overconfidence.
 - C. Social Proof.

4. What behavioral bias is most likely indicated by Philly's equity turnover rates during the 2005 – 2007 residential boom?
 - A. Herding.
 - B. Overconfidence.
 - C. Recency effect.

Case 3: Emerald

Laura Davidson is a financial advisory partner with Emerald Private Bank (Emerald). Emerald is based in Dublin, Ireland, and manages money on behalf of high-net-worth individual investors, foundations, and endowments. Davidson works in Emerald's private wealth group (PWG). This group is tasked with meeting clients, developing financial plans, and implementing recommendations from Emerald's investment committee. The PWG meets weekly to review new client relationships and to discuss the most appropriate approach for working with each client. Emerald believes there are significant benefits to incorporating behavioral finance as part of their client assessment process and has recently made changes to this effect. During preparation for the weekly PWG meeting, Davidson reviews the financial holdings of three new clients along with their risk assessment questionnaires. Her observations are summarized in Exhibit 1.

Exhibit 1	
Client Assessment Highlights	
Client	Assessment Notes
Kyra Conner	Conner is a mid level executive at a publicly traded technology company. Approximately 80 percent of her defined contribution plan is invested in her own company's stock. Conner focuses on short-term performance and is not comfortable with change. Her assessment indicates she is not comfortable taking excessive risks.
Michael Donnelly	Donnelly recently sold a large publishing firm that he founded 20 years ago. Although he has substantial assets, he spends at a rate that does not appear to be sustainable. He has a very high risk tolerance and enjoys chasing high risk investments recommended by friends. He is strong willed and questions the benefits of portfolio diversification.
Alan O'Driscoll	O'Driscoll is a retired biotechnology executive. His investment portfolio is comprised of a variety of mutual funds and stocks he has acquired over the years based on recommendations from friends and colleagues. He tends to be drawn to the latest, popular investment themes. He is indicated as a moderate risk taker.

During the meeting, fellow adviser Liam Roche makes the following observation based on the information in Exhibit 1: "Mr. Donnelly should respond favorably to education focused on how the investment program affects financial security, retirement planning, and future generations. However, Ms. Connor and Mr. O'Driscoll will respond better to education on portfolio metrics, such as the Sharpe Ratio."

Amanda Kelly is an investment strategist and a member of Emerald's investment committee. Kelly sits in on the PWG meeting to provide an update on the firm's investment themes and positioning. Emerald has developed a multi-factor macro model to forecast such variables as GDP

growth and interest rate movements. At the meeting, Kelly provides detailed information about the macro model, including many statistics on how the factors have performed using both in-sample and out-of-sample backtesting. The model appears to have had a good track record of predicting changes in the macro environment over time.

As part of her investment update, Kelly notes that the macro model predicts that interest rates in Europe are going to revert to their historical averages over the next three years and that this move will start within the next six to nine months. Davidson asks Kelly if recent unprecedented monetary policy actions by the Bank of England and European Central Bank have affected the reliability of the model. Kelly responds that because the macro model incorporates more than 100 different variables, central bank policies are accurately accounted for.

Later that day, Kelly attends Emerald's weekly investment committee meeting. Kelly brings up Davidson's concerns regarding how central bank activity may affect the accuracy of their macro model. Emerald's chief investment officer (CIO), who chairs the meeting, dismisses Davidson's concerns as uninformed. The rest of the committee members agree. The CIO then suggests updating their stock selection model to incorporate a price momentum factor. Kelly states that she is concerned that momentum will not be effective across all sectors. The CIO counters that because a number of behavioral biases support the persistence of price momentum, they would be foolish not to incorporate this factor. After a brief discussion, the other committee members agree with the CIO and momentum is added to the stock selection model.

Following the meeting, Kelly is frustrated and writes an email to the CIO with suggestions she believes will improve the dynamics of the investment committee in the future. Her recommendations include the following:

1. Spending more time analyzing prior committee decisions.
 2. Structuring the committee to ensure a higher level of common skills and experiences.
 3. Requesting stated opinions from members prior to any formal committee discussion.
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1. Roche's observation regarding client education is least likely accurate for which client?
 - A. Kyra Conner
 - B. Alan O'Driscoll
 - C. Michael Donnelly
 2. Which behavioral investor type most likely describes Michael Donnelly?
 - A. Independent individualist
 - B. Active accumulator
 - C. Friendly follower

3. In Kelly's response to Davidson, she is most likely exhibiting:
 - A. illusion of control bias.
 - B. gambler's fallacy.
 - C. self-attribution bias.

4. Which of the following biases least likely provides behavioral support for the factor being added to the stock selection model?
 - A. Framing
 - B. Availability
 - C. Hindsight

5. Which of Kelly's recommendations is least likely to be effective?
 - A. Recommendation 1
 - B. Recommendation 2
 - C. Recommendation 3

Case 4: Krista Duchene

Krista Duchene, CFA, is an investment advisor for U.S. clients. Below, she summarizes some recent conversations with her clients.

Jonathan: Jonathan faces mandatory retirement from his unionized job in five years. He has a relatively small portfolio and will be highly dependent on it in retirement. His only other asset will be a modest pension. He wants to avoid all international equities in his portfolio because he read in a few online news stories that many of them have performed poorly in the past year, despite having performed well for many years before that. Jonathan's portfolio consists primarily of investment grade bonds that he inherited from his father. He feels that his father was a knowledgeable investor, so it will be good to hold the bonds. Duchene plans to apply behaviorally modified asset allocation (BMAA) to Jonathan's situation.

Seth: Seth attended his bachelor party in Las Vegas last week where he gambled and lost \$5,000. Afraid to come home and share the news with his future spouse, he accepted a proposal with a 50% chance of losing another \$5,100 (therefore, losing \$10,100 in total) or a 50% chance of winning \$5,000 (therefore, losing \$0 in total). Being sure his luck would turn, he won and ended up breaking even overall.

Leah: Leah played a coin tossing game with her son. They tossed a quarter 10 times and it came up heads every time. Given that the long-term mean must be 50% heads and 50% tails, Leah said that the probability of tails turning up on the 11th toss is much more likely than heads.

Micah: After careful analysis, Micah purchased 200 shares of Ruby Corp. (Ruby) several months ago at \$25 per share. The share price fell shortly thereafter due to an unexpected anti-trust court ruling that increased competition in Ruby's industry. The current share price is \$20 and reliable analyst reports suggest that price properly reflects the new situation. Micah says he may consider selling his shares when the price rises above \$25.

Stacey: Stacey owns 6% of the outstanding voting common stock of a private company. She has no involvement in the company and has considered selling the shares in the past but has not found the time to do so. Also because Stacey is independently wealthy, she would have no need for the funds anyways.

1. In applying BMAA to Jonathan's situation and his desire to avoid international equity and hold the bonds, the most appropriate action would be to:
 - A. mitigate both his requests and have him invest in international equity and sell the investment grade bonds.
 - B. accommodate his request to hold the investment grade bonds.
 - C. accommodate his request not to invest in international equities.

2. Seth's behavior in accepting the 50/50 proposal is best described as:
 - A. risk averse.
 - B. risk neutral.
 - C. risk seeking.

3. Leah's description of the coin toss is best described by which of the following cognitive errors?
 - A. Anchoring and adjustment bias.
 - B. Confirmation bias.
 - C. Gambler's fallacy.

4. Which bias best describes Micah's actions with regard to his holdings of Ruby shares?
 - A. Anchoring and adjustment bias.
 - B. Confirmation bias.
 - C. Conservatism bias.

5. Which bias is Stacey most likely exhibiting?
 - A. Endowment bias.
 - B. Regret aversion bias.
 - C. Status quo bias.

6. Which of the following models least likely assumes that investors satisfice rather than maximize utility?
 - A. Behavioral asset pricing.
 - B. Behavioral portfolio theory.
 - C. Adaptive markets hypothesis.

Case 5: Arzac Wealth Management Services

Victoria Arzac recently formed Arzac Wealth Management Services, catering to high-net-worth individuals. Arzac is working with a marketing consultant to determine how she should market her firm's services. She describes her ideal clients as people who readily acknowledge their limitations regarding investments, will easily follow her advice, tend to be cautious about their investment portfolios, and are mainly concerned about conserving their capital.

In preparing for her first meeting with David Pak, a potential new client, Arzac develops a "Know Your Client" process, including the design of several tools she can use to get to know her client's investment objectives and risk profile. One of these tools is a risk tolerance questionnaire. Arzac's questionnaire contains inquiries relating to mean-variance optimization and the maximum loss the client would be willing to tolerate each year. She includes a few other questions about the client's confidence in his own abilities as an investor.

Arzac holds a meeting with David Pak, her first potential client. Arzac asks Pak to describe how he has constructed his investment portfolio over time. He informs Arzac that 12 years ago his employer offered him company shares at a discount, but share prices declined because the company wasn't performing as well as expected. He decided he would rather construct his investment portfolio by investing in three mutual funds he had analyzed, two of which were balanced funds and the third a global equity fund. Pak allocated one-third of his available funds to each of the mutual funds. Pak then describes how over the last five years, he has reviewed his portfolio each year, leading to a higher allocation in global securities over time on the understanding they would help reduce overall risk.

One day after the Brexit referendum, Arzac met with Pak for the annual review of his portfolio and an assessment of his earlier decision to continually add global securities to his portfolio. In the meeting, Pak tells Arzac he and his friends discussed the possible impact of Brexit on their portfolios if the UK decided to leave the EU. His friends subsequently got out of the market prior to the referendum. Pak, however, decided to stay in the market. The referendum results caused a sharp drop in security prices worldwide, causing Pak's portfolio value to decline by 20%. He now wants to sell the biggest losers so he can realign his portfolio because he thinks the market will continue to decline given the current momentum. Pak adds, "I should have known the Brexit referendum would go the way it did."

As Arzac continues to grow the firm, she starts building a research department so the firm is less reliant on third-party research. Arzac interviews Christine Torok, who has more than 20 years of experience as an equity analyst following the banking industry. Torok considers herself to be one of the most sought after analysts in the market, ranking in the top five analysts in the industry year after year. Her earnings forecasts have tended to be within 1% of actual results. She attributes the accuracy to her firm's highly complex forecast models, including sensitivity analysis

and the confirmation of similar information sourced from multiple databases. She is regularly asked to speak at investment conferences and on TV to make comments on financial securities.

As part of the investment management process, Arzac requires her analysts to present their investment recommendations to a newly formed investment committee. The committee, made up of five highly experienced investment professionals with extensive personal investment portfolios, meets weekly. The committee members have diverse backgrounds and contrasting personal investment styles. The committee chair insists that no opinions should be expressed until such time as the analysts presenting have made their investment case and given their investment recommendations. The chair also mandates that all presentations be made available to the committee well in advance of each meeting. At the most recent investment committee meeting, one of Arzac's analysts, despite lacking confidence in his analysis, recommends a company he knows is held in the personal portfolios of the chair and other senior members of the committee.

1. Given Arzac's description of her ideal clients, her clients could most likely be described as which type of investor personality?
 - A. Celebrity
 - B. Individualist
 - C. Guardian

2. The "Know Your Client" tools Arzac develops for new clients will most likely cause an unfavorable investor–adviser relationship for which investor type?
 - A. Active Growth
 - B. Active aggressive
 - C. Passive moderate

3. Which behavioral factor most likely impacted Pak's decisions on how to construct his investment portfolio over time?
 - A. Naive diversification
 - B. Home bias
 - C. Familiar investing

4. Pak's conversation with Arzac in the annual review meeting after the Brexit referendum most likely reflects which type of bias?
 - A. Herding
 - B. Hindsight

- C. Loss aversion
- 5. Given Torok's analysis of the banking industry, she least likely exhibited which of the following behavioral biases?
 - A. Self-attribution
 - B. Overconfidence
 - C. Illusion of control
- 6. What is the most likely criticism of Arzac's investment committee? The committee:
 - A. chair may dictate decisions.
 - B. is unlikely to reach group consensus.
 - C. exhibits social proof bias.

2. SS12-13 Private Wealth Management

Case 1: Boylan

The human resources department of The Tredway Medical Group hired Joe Boylan, a private wealth consultant, to provide a series of presentations to its employees covering the fundamentals of financial planning.

Boylan's current presentation deals with two aspects of personal risk management related to age: premature death and outliving one's resources. He begins his presentation by stating that people often harbor misleading views about life insurance. As an example, he provides them with the following three comments which he claims to have heard many times in the past:

Comment 1 Since everyone is going to die, everyone needs life insurance.

Comment 2 Life insurance is an efficient method of risk reduction.

Comment 3 Premiums on a newly issued life insurance policy are higher when interest rates are lower.

Boylan states that when considering life insurance needs and investment strategies, it is important to understand the notion of human capital. He provides the following four examples of individuals connected to the health care industry in Exhibit 1 and asks the audience which of them has the highest human capital risk.

Exhibit 1	
Four Individuals Connected to the Health Care Industry	
Henry	<ul style="list-style-type: none">➤ A 33-year-old orthopedic surgeon.➤ A leading financial publication ranks orthopedic surgery as the highestpaying medical specialty.➤ Has been practicing for three years but still has over \$80,000 of studentloans outstanding.➤ Married with a one-year-old son.
Marie	<ul style="list-style-type: none">➤ A 62-year-old cardiac surgeon who is celebrating her birthday today.➤ Plans on retiring in two years, on the day before she turns 64.➤ The previously-mentioned financial publication ranks cardiac surgery as the second highest paying specialty.➤ A member of Mensa (the largest and oldest high IQ society in the world) with the highest Mensa IQ of any other Mensa member in her profession.➤ A widow with three financially independent adult children.➤ Has no debt and her total assets calculated using a traditional balancesheet amount to \$4 million, which includes \$3 million in stocks and bonds and \$250,000 in real estate.

Jason	<ul style="list-style-type: none"> ➤ A 50-year-old medical technician. ➤ Also a member of Mensa, with a perfect score on the Mensa IQ test. ➤ A single parent with a 20-year-old daughter. ➤ Has no outstanding debt and an investment portfolio currently valued at \$125,000. ➤ His employer provides him with a defined benefit pension whose pension payments will adjust with inflation.
Janice	<ul style="list-style-type: none"> ➤ Jason's twin sister. ➤ Works as a stock broker specializing in medical technology. ➤ Has no outstanding debts and an investment portfolio currently valued at \$375,000. ➤ Her employer provides her with a defined contribution pension. ➤ Unmarried with no dependents. ➤ Has about the same level of risk tolerance as Jason.
<p>Note: All of these individuals are non-smokers and are in excellent health given their respective ages.</p>	

Boylan provides selected information from standard mortality tables along with some market data and characteristics of Marie's medical specialty in Exhibit 2. In addition, he also includes several assumptions which he uses to determine Marie's total assets under a holistic balance sheet.

Exhibit 2					
Inputs used in determining Marie's Assets under a Holistic Balance Sheet					
Mortality Statistics for Non-smoking Females					
Age	62	63	64		
Probability of Dying	0.0059	0.0069	0.0079		
Characteristics of Income for Cardiac Surgeons					
Annual wage growth rate		5%			
Occupational income volatility		1%			
Nominal risk free rate		3%			
Marie's current employment income		\$430,000			
Marie's current pension value		\$1.75 million			
Assumptions:					
<ul style="list-style-type: none"> ➤ All income is received at the end of the year ➤ All probability-based calculations are carried out to 4 decimal places. 					

One of the attendees at the presentation told Boylan that she had accessed several life insurance carrier websites but found that it was very hard to compare the costs of their whole life policy offerings, as the companies often used different assumptions about the amount of the death benefit, premiums, cash value growth rates and dividend reinvestment rates. Using the

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information in Exhibit 3 for a hypothetical whole life policy, Boylan illustrates a convenient method for comparing the cost of different policies when these variables change.

Exhibit 3	
Hypothetical Whole Life Insurance Policy	
Death benefit	\$300,000
Expected holding period	25 years
Annual premium, paid at start of year	\$2,750
Estimated cash value at the end of 25 years	\$60,000
Discount rate	6%
Dividend reinvestment rate	6%
Estimated annual dividend, paid at year end	\$850

Boylan turns his attention to investments. He tells his audience that if the twins, Janice and Jason, wish to invest optimally, they should consider the nature of their human capital when making asset allocation decisions. He asks how this would affect their relative allocation to high grade government bonds.

Boylan tells the audience that life annuities are a convenient investment to deal with longevity risk. He again uses the twins, Jason and Janice, as an example, in discussing some of the characteristics of these annuities. Assuming that they were both to invest the same amount into this product, he makes the following statements:

Statement 1 If both of them were to purchase the annuity immediately, they would both receive the same annual income yield.

Statement 2 If Jason were to purchase the annuity in 10 years rather than immediately, his annual income yield would be higher at that time than now.

Statement 3 If Janice were to add a 10-year period certain option to her annuity, her income yield would be reduced when compared to not having the option, but it would be reduced by greater amounts the longer she waits to purchase the annuity.

1. Which of Boylan's initial comments about life insurance is most accurate?
 - A. Comment 2
 - B. Comment 1
 - C. Comment 3

2. From Exhibit 1, the individual who has the greatest amount of human capital at risk is:
 - A. Marie.
 - B. Henry.
 - C. Jason.

3. Using Exhibits 1 and 2, Marie's total assets under a holistic balance sheet are closest to:
 - A. \$6,558,000.
 - B. \$6,563,000.
 - C. \$4,808,000.

4. Using the information in Exhibit 3, the surrender cost index per \$-thousand per year for the hypothetical whole life policy is closest to:
 - A. \$3.05.
 - B. \$2.69.
 - C. \$6.49

5. The most appropriate response to Boylan's question about the twins' relative allocation to high grade bonds is that, when compared to Jason, the proportion in Janice's investment portfolio should be:
 - A. the same.
 - B. lower.
 - C. higher.

6. Which of Boylan's statements about life annuities is least accurate?
 - A. Statement 2
 - B. Statement 1
 - C. Statement 3

Case 2: Cooper Reyder

Cooper Reyder was asked by her employer, Astounding Wealth Advisors, to attend a symposium on managing assets for high-net-worth individuals. Sessions were available covering a wide range of topics, including managing individual investor portfolios, lifetime financial advice, setting asset allocation policies, and applying risk tolerance concepts to asset allocation. The Jones Family Case Study, shown in Exhibit 1, provided a helpful framework to present and discuss many of the concepts. The moderator, Vince Dunne, conducted the sessions using panel discussions and lectures, each followed by question and answer (Q&A) periods.

The initial session on lifetime financial advice evolved into a discussion of the concept of human capital. The speaker briefly described how the present value of an individual's lifetime of income can be considered as an asset class that should be viewed in relation to financial assets. During the lengthy Q&A period, Reyder made the following additional notes:

- Term life insurance is superior to lifetime payout annuities when attempting to hedge against the risks of the loss of human capital.
- Risk tolerance of the combined portfolio of financial assets and human capital increases proportionally with greater human capital regardless of wage earnings risk.
- The magnitude of loss of human capital at younger ages is less important than the higher probability of death at older ages.

Exhibit 1			
The Jones Family			
Family Member	Peter married to Gladys for 33 years	Gladys married to Peter for 33 years	Mark son and sole heir of Gladys and Peter
Age	56	55	30
Occupation	Owns architecture firm	College library director	Stock broker
Annual Compensation	\$70,000 salary plus \$25,000 bonus when business is good	\$55,000 cost of living raises averaging 2% each of last 10 years	\$40,000 salary plus commissions which were equal to his salary last year in a bull stock market
Psychological Risk Profile Types	Individualist	Methodical	Spontaneous
Stated Goals Client	Retire within ten years. Sell company for at least \$2 million	Not to outlive our assets	To benefit from a \$1 million irrevocable trust that Dad has promised to establish for me when he sells the company

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Investment Portfolio	Jointly owned portfolio valued at \$600,000	\$120,000 stock portfolio
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During the next session about the influence of the psychological risk profile types on various decisions to be ultimately made by the Jones family, Reyder made the following comments:

"Like his mother, Mark is likely to base his decisions on feelings rather than logical thinking. Among the three of them, Gladys is likely to be the most self-assured and independent when choosing a course of action. Peter's type indicates he is more likely to seek a greater allocation to equities in retirement than his wife."

Beyond the material in Exhibit 1, a panel discussion on retirement planning began with an initial set of assumptions for Gladys and Peter's retirement period:

- Both retire in the year Peter turns 65, and each has a life expectancy of 85 years.
- Asset allocation for the investment portfolio, as determined by a real return mean-variance model, will be 50% equities and 50% bonds.
- The portfolio will have a constant real rate of return of 3.5%.
- Systematic withdrawals will occur that increase with inflation.
- At retirement, purchase a \$300,000 20-year term life insurance policy on Peter.

Moderator Dunne asked, "Are there any problems with the way the family's risks are being addressed in retirement?" In the Q&A session, Reyder asked, "When is it appropriate to use a validated questionnaire to assess risk? I've heard the following conflicting views from different financial advisers: Some say it is appropriate

- in order to help an adviser better understand behavioral drivers that lead to individual's risk-taking decisions.
- only in the case when one can assume that investors facing choices with equivalent returns will choose the investment with the lowest risk.
- when clarifying the source of wealth, measure of wealth, and stage of life contribute to identifying risk tolerance."

During a discussion of ways Gladys could achieve her stated goal, the following statements were made:

- A jointly owned fixed annuity lifetime payout would achieve her goal as well as providing purchasing power protection.
- A jointly owned variable payout lifetime annuity product would also meet her goal but would provide less certainty in terms of cash flow.
- Although annuity products would help, it is more important to change the asset allocation of the joint portfolio toward less risk.

Mark's stated goal prompted a review of the use of trusts to implement investment and estate planning strategies. Reyder was unfamiliar with trusts. After listening to Dunne's lecture on the

topic, Reyder summed up the possibilities to see if she had heard him correctly.

"In establishing an irrevocable trust, Peter would be the grantor and Mark would be the beneficiary. A motivation for using this structure could be for Peter to make resources available to Mark without yielding control of those resources to him. A discretionary irrevocable trust could enable the trustee to determine how much to distribute to Mark from time to time based on Mark's general welfare, but the assets cannot be protected from claims made by Mark's creditors."

1. Which of Reyder's additional notes from the discussion on human capital is most accurate?
Her note about:
 - A. the magnitude of loss of human capital
 - B. the risk tolerance of the combined portfolio
 - C. term life insurance versus annuities

2. The best answer to Dunne's question about the family's risk exposure in retirement is:
 - A. the proposed life insurance purchase adequately protects against Peter's mortality risk.
 - B. that the family's risks are appropriately addressed because the mean-variance model accounts for both financial market and longevity risks.
 - C. financial market risk remains, given the rate of return and withdrawal assumptions.

3. Which of the statements made about meeting Gladys' stated goal is most accurate? The statement regarding:
 - A. fixed annuity products
 - B. revised asset allocation
 - C. variable annuity products

4. In Reyder's summary on the use of trusts to meet Mark's stated goal, the statement that is least accurate is the one dealing with:
 - A. claims by creditors.
 - B. yielding control of resources.
 - C. trust distributions.

Case 3: Buylak

Geri Buylak, a financial adviser, is preparing for a meeting with Kasey McLoughlin, the recent widow of Bryn McLoughlin, a resident of the country of Weshvia. From her files for the McLoughlin family, Buylak notes the following facts, which she thinks might be relevant in the meeting:

- Kasey was Bryn's second wife.
- Bryn had been the sole provider for his grandson Paulo for the past 20 years; Paulo was orphaned at the age of three and initially lived with Bryn and his first wife. Mainly as a result of the stress arising from the disabilities and medical problems that Paulo developed, Bryn's first marriage ended in divorce within one year. Two years later, it was determined that Paulo would be better off living in a private care facility in the sunny warm climate of Izlandia, where he continues to live today.
- To ensure that Paolo's future needs would be met, shortly after the child was orphaned, Bryn purchased a €3 million life insurance policy on his own life for a one-time premium of €500,000. At the same time, Bryn's father bought a similar, but smaller, policy on his own life. Ownership of both policies was transferred to a discretionary irrevocable trust with Paolo as the primary beneficiary and the University of Izlandia as the remainderman.
- Buylak was appointed as the investment adviser for the trust.
- Bryn and Kasey were married two years after Bryn's divorce from his first wife.

Buylak had been faxed a copy of Bryn's will and in combination with other information she had available made the following notes:

- Two years ago, Bryn disposed of his very successful construction company and invested the proceeds in two overseas distribution centers. The first property is located in the country of Landlochen, and at the time of his death it was jointly owned with Kasey with the right of survivorship. For the second of these properties, Bryn's will named Paolo as the beneficiary of the property. The property is located in Izlandia, where Paolo resides.
- Kasey was named the beneficiary of Bryn's taxable account and two tax-advantaged retirement accounts.
- Weshvia, Izlandia, and Landlochen all use the euro, and none of the three tax regimes impose any tax consequences on spousal transfers either before or after death.

As they begin their meeting, Kasey first asks Buylak if any of the provisions of the life insurance policy or dispositions of the investment properties might be challenged in the probate process.

Kasey mentions to Buylak that she is aware that a large part of her wealth now depends on the investment property in Landlochen. She asks Buylak what cash flow will be available to her annually after taxes from its lease income and what after-tax cash proceeds she might obtain if the property were to be sold when the current lease expires. Buylak had prepared for these

questions, and her responses were based on the following:

- The investment real estate property in Landlochen had a cost basis of €2,900,000 and has a present market value of €3,000,000. It produces income of €450,000 (pre-tax) annually through a lease agreement that expires in five years.
- After reviewing several reports analyzing Landlochen real estate values, Buylak estimates that the property could be sold at the termination of the lease at 30% above its present market value.
- The tax structure in Landlochen differs from Kasey's home country Weshvia, as shown in Exhibit 1. Fortunately, there is a provision for some relief from double taxation. Weshvia allows use of the deduction method with regard to income taxes and the credit method toward capital gains.

Exhibit 1		
Tax Rates on Investment Property Relevant to Kasey McLoughlin		
	Country	
Type of Real Estate Property Tax	Landlochen	Weshvia
➤ Wealth tax	1.5% of cost basis, accumulated annually and paid at the time of sale	None
➤ Income tax	35% of annual income	25% of annual income
➤ Capital gains	20% at time of sale	25% at time of sale
Applies to location	Locally operating within borders	Owned by residents anywhere in the world

On the basis of her calculations for the cash flows from the Landlochen investment property, Buylak recommends that the three inherited investment accounts be held for the next 12 years with all earnings and gains reinvested. In anticipation of another after-tax cash flow question, she estimates the accrual equivalent after-tax rate of return on the portfolio of combined accounts over the next 12 year period using the information in Exhibit 2.

Exhibit 2			
Panel A. Kasey McLoughlin's Inherited Investment Portfolio			
	Taxable	Tax Deferred	Tax Exempt
Current asset value in euros	1,200,000	700,000	180,000
Expected rate of annual pre-tax return	12.00%	7.50%	11.00%
Panel B. Tax Treatment of Investment Income in Weshvia			
Taxable accounts	Total returns are taxed at 28% annually		
Tax-deferred accounts	Distributions are taxed at 40% with deferral allowed for a maximum of 12 years, at which time a full distribution is required		

Bryn's father died about a year after Bryn, creating additional life insurance proceeds paid to

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Paolo's trust from Bryn's father's policy. Buylak considers investment changes she should now make to Paolo's trust portfolio. Because it consists entirely of domestic securities, Buylak wants to consider adding securities from other parts of the world as an additional asset class. She identifies three international managers who each use a balanced portfolio approach with solid long-term track records.

The existing portfolio has a Sharpe ratio of 0.54, and Buylak's goal is to improve the overall portfolio's risk-return trade-off. She assembles the data shown in Exhibit 3 and uses it exclusively in determining which manager to select.

Exhibit 3 Portfolio Statistics from Three Potential Portfolio Managers			
Manager	Risk Premium (%)	Standard Deviation (%)	Correlation with Present Portfolio (%)
Europe	4.1	8.9	0.76
Asia	5.2	10.6	0.78
Americas	3.9	7.1	0.91

Note: All risk premiums, standard deviations, and correlations have been calculated based on the euro.

1. If Paolo had predeceased Bryn, the life insurance proceeds would most likely have been paid to:
 - A. Bryn.
 - B. Kasey.
 - C. the University of Izlandia.

2. Buylak's best response to which of the items might be challenged in the probate process is the:
 - A. Izlandia distribution center.
 - B. Landlochen distribution center.
 - C. proceeds of the life insurance.

3. Using Exhibit 1, the annual amount of after-tax cash flow that will be generated by the Landlochen property lease is closest to:
 - A. €219,375.
 - B. €230,625.
 - C. €175,875.

4. If Buylak's expectations about the Landlochen investment property are realized, using Exhibit 1, the after-tax net cash proceeds that Kasey will receive at the end of the lease is

closest to:

- A. €3,432,500.
- B. €3,232,500.
- C. €3,457,500.

5. Using Exhibit 2, the accrual equivalent after-tax annual return that Buylak calculates for Kasey's investment portfolio is closest to:

- A. 7.35%.
- B. 7.45%.
- C. 7.58%.

Case 4: Richards

Edvard Richards is president and sole owner of More Than Lumber Corporation (MTL), a privately held building materials company. Founded by the Richards family, the company has been run by Edvard Richards for over 40 years. Richards also owns investment real estate in the form of a warehouse unrelated to MTL, as well as 70,000 common shares of publicly traded Cintas (CTAS) that he inherited. He wants these two items to be considered concentrated positions.

Now 68, Richards is seeking advice on how to transition to retirement. He provides information about his holdings (Exhibit 1) to two competing financial advisers, Todd Adams and Linda Boshe:

Exhibit 1		
Richards's Values		
Asset	Estimated Value (\$000's)	Cost Basis (\$000's)
Primary residence (no mortgage)	2,000	2,000
MTL Corp	11,000	2,000
Common stock (70,000 shares CTAS)	4,000	1,000
Warehouse	3,000	4,300
Municipal bond portfolio	3,000	3,150
Global All Cap Equity Fund	3,400	1,650
Cash equivalents	300	300
Tax Rates		
Capital gains tax rate = 20%	Income tax rate = 40%	

Richards asks each adviser to apply a goal-based planning framework he has read about that uses three risk buckets: personal, market, and aspirational. As a first step, he estimates his own after-tax primary capital assuming that all assets are sold today and converted into cash. He asks the two advisers to assess his after-tax primary capital under the same assumptions (all three estimates are provided in Exhibit 2).

Exhibit 2	
Estimates of After-Tax Primary Capital (\$000's)	
Richards	11,780
Adams	8,380
Boshe	11,640

Richards wants to monetize and eliminate the concentration risk of his CTAS holding without paying taxes on capital gains and then invest the proceeds in a balanced portfolio. He notes the following comments in his discussions with the two advisers:

Richards: "My broker says he can arrange a cashless collar against CTAS or a short sale against the box. I understand that both methods will avoid incurring an immediate capital gain and both will expose me to the same level of market risk. I can borrow against the position in both cases and

offset the cost of borrowing with the CTAS dividends."

Adams: "We could help you complete a short against the box transaction. This strategy will provide a high loan-to-value (LTV) ratio and avoid counterparty risk. A total return equity swap has these same advantages. You can thus realize the economic gain on CTAS while deferring capital gains taxes."

Boshe: "We suggest either a forward conversion with options or an equity forward sale. Either will achieve high LTV ratio monetization without incurring immediate capital gains taxes, and both methods avoid counterparty risk."

Adams has strong connections to the real estate market and informs Richards that the market value estimate of \$3 million for the warehouse is much too low. He advises Richards to consider reducing his real estate risk directly by, using the immediate cash inflows, net of tax liabilities and costs, to increase his stock and bond portfolios. Adams is confident he can arrange any of the following real estate offers:

1. Sell the warehouse for \$4.8 million to an outside investor.
2. Enter into a recourse mortgage loan with the warehouse valued at \$5.8 million by the lender and an LTV ratio of 80%.
3. Enter into a sale-and-leaseback, with the warehouse valued at \$4.9 million and the first year's rental payment of \$150,000 payable at the start of the lease.

Boshe has strong connections to the investment banking community. Richards has authorized her to ascertain the level of interest for the sale of MTL. Boshe is confident she can arrange any of the following strategies:

MTL Strategy 1: A private equity firm can arrange to leverage MTL, paying Richards 40% of his estimated value of MTL (as shown in Exhibit 1), in cash up front and rolling the remaining 60% of the value into new shares that pay no dividends. Richards will stay on as president for five years, during which time he will help transition leadership to a new team. After five years, he will sell or monetize the remaining ownership.

MTL Strategy 2: A small but rapidly growing publicly traded building materials company is willing to acquire 100% ownership and pay Richards \$7 million in cash up front and employee stock options that he can exercise after two years and that expire in five years. The public company is too small to support publicly traded stock options. Should the public company's stock rise, Richards can exercise his employee stock options, which will be taxed as ordinary income. To protect the value of his appreciated stock while participating in further upside potential, he can purchase long-term protective put options on an industry ETF that closely tracks the building materials industry. If the public company's stock subsequently drops along with the industry, he can sell the puts.

MTL Strategy 3: Create an employee stock ownership plan (ESOP) that would borrow sufficient

funds to purchase 40% of Richards' ownership. Richards would maintain upside potential in his retained shares, which could be sold at some point in the future.

1. Using the planning framework that Richards suggests, which person's estimate for the after-tax primary capital is most accurate?
 - A. Boshe
 - B. Adams
 - C. Richards
2. Richards's understanding about monetizing CTAS is most accurate with respect to:
 - A. the risk exposure of both strategies.
 - B. using the CTAS dividends to offset borrowing costs.
 - C. avoiding immediate capital gains under both strategies.
3. Which of Adams's and Boshe's comments about counterparty risk is most accurate? The comment made by:
 - A. Adams about the short sale against the box.
 - B. Boshe about her proposed strategies.
 - C. Adams about the total return equity swap.
4. Using the information in Exhibit 1 and Adams's real estate proposals, which offer will provide the largest immediate addition of funds to Richards's stock and bond portfolios?
 - A. Offer 1
 - B. Offer 2
 - C. Offer 3
5. Which of Boshe's MTL strategies least likely describes a staged exit strategy? MTL Strategy:
 - A. 1
 - B. 3
 - C. 2
6. Which of the following statements about Boshe's proposed exit strategies from MTL is most accurate? MTL strategy:
 - A. 3 exhibits a mismatch in character.
 - B. 2 exhibits cross hedging.
 - C. 2 provides for the possibility of yield enhancement.

Case 5: James Hatfield Scenario

James Hatfield, CFA, manages money for several clients. The clients reside in various countries. Some of them reside in countries that do not currently have tax-advantaged accounts. Hatfield watches for changes in the tax laws of the countries to see when accounts such as tax-exempt accounts and tax-deferred accounts become available. Hatfield wants to react quickly in such cases so that his clients respond as soon as they can to changes in the availability of these accounts.

Hatfield is also doing general counseling with his clients about how they should manage their accounts for tax purposes. One of his newest clients, Chrissie Hynde, lives in a country with a flat and heavy tax regime. She already has a small portfolio of investment assets and asks for Hatfield's advice about the current allocations. Currently, her portfolio is in a taxable account and is equally allocated among interest-paying assets, dividend-paying assets and non-dividend-paying growth stocks. Hynde is young and her income is relatively low, but she is in a job that has a high degree of job security and where she expects her income to increase dramatically in about ten years and then for the rest of her career. She expects her retirement income to be equal to the wage income she will be earning when she retires. She asks Hatfield about tax-advantaged accounts. If they become available, she wants to know which tax-advantaged account, if any, would benefit her the most.

Hatfield has another client, Rick Mars, who lives in a country with a heavy capital gains tax regime. The tax regime is not expected to change. Mars asks Hatfield about harvesting losses. Mars has a position in Chromoly stock, which he accumulated over several years at successively higher prices. Mars now plans to liquidate some of his position in Chromoly. He asks Hatfield his advice concerning the best way he should go about this.

Mars wants to make sure his portfolio of investment assets is a mean-variance optimal portfolio. In a preliminary analysis, Hatfield concludes Mars's current portfolio is optimal. As of now, however, Mars's country does not have any tax-advantaged accounts. The news has just come out that tax-exempt accounts may soon become available. Categorizing Mars's investments into the three basic categories of interest-paying investments, dividend-paying investments, and non-dividend paying growth investments, Mars asks how the availability of tax-advantaged accounts would influence the determination of the optimal weights.

1. What adjustment would Hatfield most likely make to Hynde's portfolio?
 - A. Increase the allocation to interest-paying assets.
 - B. Increase the allocation to dividend-paying assets.
 - C. Increase the allocation to non-dividend-paying growth stocks.

2. Given Hynde's expectations concerning her future income and postretirement income, would the tax-exempt account or the tax-deferred account be more beneficial?
 - A. The tax-exempt account.
 - B. The tax-deferred account.
 - C. Neither has an advantage over the other.
3. Based on how Mars accumulated the position in Chromoly, Hatfield should advise Mars to:
 - A. sell the shares that were acquired first.
 - B. sell the most recently acquired shares first.
 - C. sell shares from each purchase and in proportions equal to the positions.
4. If tax-advantaged accounts become available to Mars, the optimization process would become:
 - A. less complicated because the new tax regime would create a level playing field.
 - B. ineffective because there is no way to create an optimal portfolio given the multiple tax effects.
 - C. more complicated because the number of weights to compute would increase from three to six.

Case 6: Rhys Jacobs

Rhys Jacobs is a 70-year-old resident of Sahjong, a small island country off the coast of Australia that caters to high-net-worth individuals because of its low tax rates and status as a sought-after free trade zone. Jacobs grew up in Sahjong and is a well-respected entrepreneur.

Jacobs has long put it off but believes that now is the time to finally receive some much-needed assistance in tax-efficient wealth accumulation, retirement and estate planning, and other financial matters, so he recently hired Jassica Simson as his tax and financial adviser.

In preparing for their introductory meeting, Jacobs performs initial research on various tax-planning strategies available in Sahjong, where the capital gains tax rate is much lower than the income tax rate. He finds several strategies that might be appropriate for his investment portfolio and summarizes them as follows:

- 1 A strategy based on low portfolio turnover whereby assets are held for extended periods
- 2 A strategy that concentrates on tax-exempt securities
- 3 A strategy to restructure his portfolio to focus on annual capital gains versus income generation.

Jacobs provides materials to Simson, including the following notes he took from a recent financial blog discussing the various tools currently being used in retirement planning:

- 1 Long-term market return and historical inflation averages are simple but effective strategies for accurately extrapolating how much wealth will be accumulated after a period of time if one could earn, say, 10% a year.
- 2 The Monte Carlo approach helps an investor get to a straightforward “yes/no” determination on whether a particular retirement income goal can be achieved.
- 3 Given a particular investment strategy, the likelihood of achieving a certain percentage return throughout retirement can be answered with a Monte Carlo simulation.
- 4 Sustainable spending rates in retirement can be approximated without the need for a Monte Carlo simulation by using the notion of ruin probabilities.

Jacobs asks Simson to evaluate these notes.

Simson states that she is very much in favor of a long-term buy-and-hold strategy focused on capital appreciation. She states that investors often do not realize just how much of their investment returns are consumed by taxes, and she provides Jacobs with the data in Exhibit 1 to illustrate the point.

Exhibit 1 Data Illustrating the Effect of Taxes on Wealth Accumulation	
Initial investment	\$250,000
Holding period	25 years
Expected annual gain	8%
Tax rate on investment returns	10%

Turning to retirement planning, Simson confirms that sustainable spending rates in retirement can be approximated without the need for a Monte Carlo simulation by using the notion of ruin probabilities (as developed by Milevsky and Robinson). The analysis incorporates lifespan uncertainty as well as financial market risk. After they discuss the method, Jacobs asks her to determine how much he could withdraw annually from a balanced portfolio if he wants to be at least 94% certain that the portfolio will last for the remainder of his life. He states that the current value of his (balanced) portfolio is \$2 million, made up of 50% income-producing equities and 50% bonds. Simson uses the ruin probabilities in Exhibit 2 as the basis for her calculation of Jacobs' lifetime sustainable annual withdrawal.

Exhibit 2 Ruin Probabilities for a Balanced Portfolio: 50% Equity and 50% Bonds										
		Real Annual Spending per \$100 of Initial Nest Egg								
Current Age	Hazard Rate, λ (%)	\$2 (%)	\$3 (%)	\$4 (%)	\$5 (%)	\$6 (%)	\$7 (%)	\$8 (%)	\$9 (%)	\$10 (%)
70	4.75	0.8	2.8	6.3	11.4	17.6	24.7	32.2	39.8	47.2

Jacobs owns a controlling interest in a rapidly growing private firm that explores for and produces oil. The firm generates steady cash flow but is considered illiquid. Simson explains that Jacobs' death could create significant inheritance taxes. She suggests an insurance policy to help fund any future inheritance taxes and help offset the risk of a tax liability combined with an illiquid asset. Jacobs is confused about the use of life insurance and asks Simson to verify the following statements:

- The combination of a life insurance policy and a trust is likely to be redundant and unnecessary.
- Death benefits from a life insurance policy are usually taxable at favorable rates.
- Premiums paid by the policyholder are typically neither part of the policyholder's taxable estate at the time of his or her death nor are subject to a gratuitous transfer tax.

The oil firm that Jacobs controls is headquartered in the island country of Mahjong, located near Sahjong. Because of the foreign location of the oil firm, Simson believes there might be opportunities to reduce taxes.

Simson knows that Sahjong uses the exemption method, whereby it does not impose taxes on income that stems from a foreign country. However, Sahjong will soon hold parliamentary elections, and the opposition party is said to favor the deduction method. Simson plans to investigate how this possible change might affect Jacobs' tax liability. She compares the tax rates in the two countries in Exhibit 3.

Exhibit 3 Comparative Income Tax Rates

Country	Sahjong	Mahjong
Income tax rate	10.00%	15.50%

1. Which of the tax-planning strategies summarized by Jacobs is best described as tax deferral?
 - A. Strategy 1
 - B. Strategy 2
 - C. Strategy 3

2. Which of Jacobs' notes on retirement planning from the financial blog is most accurate?
 - A. Note 3
 - B. Note 2
 - C. Note 1

3. Based on the data in Exhibit 1 and assuming that all returns are taxed annually, the proportion of the investment's return that is consumed by taxes is closest to:
 - A. 19.9%.
 - B. 17.0%.
 - C. 10.0%.

4. Based on Exhibit 2 and Jacobs' stated level of concern for the probability of retirement ruin, the lifetime sustainable annual withdrawal is closest to:
 - A. \$80,000.
 - B. \$120,000.
 - C. \$95,000.

5. Which of the statements about life insurance is most appropriate?
 - A. The statement about tax treatment of death benefits.
 - B. The statement about combination of life insurance and trusts.
 - C. The statement about premiums paid by policyholders.

6. If the opposition party wins the election in Sahjong and its tax proposals are passed into law, the tax rate that Jacobs will face on income stemming from Mahjong will be closest to:
 - A. 0.0%.
 - B. 15.5%.
 - C. 24.0%.

Case 7: Connor McClelland

Conner McClelland is a private client financial consultant with US-based Edmonstone Wealth Management LLC. McClelland has been engaged by Bradley and Reagan Graham to develop a personal wealth management plan. Prior to meeting with McClelland, the Grahams filled out a personal profile questionnaire that will be used in developing their wealth management plan. Using information from the questionnaire, McClelland prepares Exhibit 1.

Exhibit 1 Graham Family: Personal and Financial Information	
Occupations and Family Structure	
● Bradley is a 50-year-old electrical engineer at a major utility company. His annual income of \$175,000 is projected to increase 3% per year. He has a defined-contribution pension plan and expects to retire at age 65.	
● Reagan is a 48-year-old pharmacist with a pharmaceutical company. Her annual income of \$132,000 is projected to increase 3% per year. She has a defined-contribution pension plan and expects to retire at age 65. Prior to joining the pharmaceutical company, Reagan had a 20-year career in the US Navy, retiring at the rank of commander.	
● The family has two children, ages 10 and 8.	

Financial Information	
Checking account	\$27,000
Taxable investment account	625,000
Residence	525,000
Residential mortgage	285,000
Outstanding balance on a \$100,000 home equity line of credit	38,000
Bradley's defined-contribution plan (vested; normal retirement age for the plan is 65)	796,000
Cash value of Bradley's life insurance (\$250,000 death benefit)	67,000
Estimated present value of Bradley's future earnings	2,150,000
Reagan's defined-contribution plan (vested; normal retirement age for the plan is 65)	160,000
Present value of Reagan's military pension (vested; inflation indexed; survivor benefit)	1,320,000
Cash value of Reagan's life insurance (\$250,000 death benefit)	52,000
Estimated present value of Reagan's future earnings	1,790,000
Estimated present value of the Grahams' future consumption	3,700,000

Aspirational and Other Goals
Cost of four years of university for the two children, with an estimated present value of \$350,000

Purchase of a vacation home in the next five years, with an estimated present value of \$325,000

Donations to charitable organizations during the next 15 years, with an estimated present value of \$400,000

At their initial meeting, Bradley tells McClelland that he recently attended a financial planning seminar conducted by his employer's human resources department. One of the presenters discussed the importance of preparing and understanding the components of an economic balance sheet compared with a traditional balance sheet. Bradley was confused by a few of the presenter's comments and asks McClelland for further clarification. The presenter's comments were as follows:

- Real estate can be described as a personal asset, an investment asset, and a mixed asset.
- Financial capital consists of tangible and intangible assets, including both the vested and unvested portions of an employer pension plan.
- The value of human capital relative to overall economic wealth is typically higher for an individual in mid-career with an established earnings record than for an individual in the early stages of his career.

As McClelland reviews insurance coverage with the Grahams, he explains that there are various ways to manage risk. "It depends on the frequency of a risk occurring and the severity of the potential loss. For example, consider the following two risks:

- An earthquake: This risk seldom occurs but would result in a large financial loss;
- Dental cavities: This risk arises frequently, resulting in small financial losses."

McClelland determines that both Bradley's and Reagan's life insurance coverage is inadequate. Bradley is particularly concerned about the inadequacy of his life insurance and asks McClelland to calculate how much additional insurance he should purchase to cover him until he retires in exactly 15 years and begins to receive his employer pension. McClelland prefers to use the human life value method to determine the appropriate level of life insurance coverage. Exhibit 2 contains additional personal and financial information about Bradley.

Exhibit 2 Bradley Graham: Additional Personal and Financial Information

Current annual income; salary and expenses expected to increase 3% per year	\$175,000
Income and payroll taxes (percentage of annual income)	30%
Employer contribution to defined-contribution plan (percentage of annual income)	5%
Annual family expenses attributable to Bradley	20,000
Estimated tax rate on income earned on insurance proceeds	20%
Applicable discount rate	4%

The Grahams mention that a primary concern is the ability to manage the risks to both their

financial and human capital so that they can achieve their financial goals of maintaining a comfortable lifestyle while having sufficient assets to purchase a vacation home, pay for their children's university education, and fund charitable donations.

Bradley mentions that he and Reagan have some concern about possibly outliving their assets and that he understands annuities can help protect against this risk. He is interested in an annuity that will provide income for as long as one of them is alive. The Grahams have average risk tolerance and expect they will be able to adjust their spending in retirement if necessary.

1. Using the data in Exhibit 1, the Grahams' net wealth (in thousands) is closest to:
 - A. \$2,174.
 - B. \$2,414.
 - C. \$2,795.

2. Which of the presenter's comments regarding economic and traditional balance sheets is most accurate?
 - A. The comment about human capital
 - B. The comment about financial capital
 - C. The comment about real estate

3. Which of the following risk management techniques is most appropriate for the second risk exposure example provided by McClelland?
 - A. Risk retention
 - B. Risk reduction
 - C. Risk transfer

4. Based on the data in Exhibits 1 and 2 and using the human life value method for determining life insurance needs, the additional amount of life insurance that Bradley should purchase is closest to:
 - A. \$1,701,345.
 - B. \$1,547,862.
 - C. \$1,951,345.

5. Risk to which of the following is least likely to compromise the Grahams' ability to achieve their financial and aspirational goals?
 - A. Health
 - B. Earnings

C. Property

6. The type of life annuity that is most consistent with the Grahams' risk tolerance and retirement spending plans is a:
 - A. variable joint life annuity.
 - B. fixed joint life annuity.
 - C. variable life annuity with period certain.

3. SS5 Asset Allocation

Case 1: Windsong

Eunice Fox is head of Strategic Asset Allocation at Windsong Wealth Management, Inc. (WWM). WWM's clients include pension funds, foundations, sovereign funds, high-net-worth individuals, and family trusts. Fox is in the process of hiring an asset allocation analyst and has just completed interviewing two candidates, Ambrose Kelly and Catherine Trainor, for the position. The interviews were directed around the case study of Jane Lennon, a fictitious client, described in Exhibit 1. Fox reviews her interview notes.

Exhibit 1 Case Study of Jane Lennon

Name	Jane Lennon
Occupation and Family Structure	She is the morning news anchor for a national broadcasting company, where she has worked for the past 20 years. She is 56 years of age, divorced, and the sole supporter of her two children, Everett, aged 18, and Marshall, aged 14. Marshall suffers from severe medical and developmental issues.
Current and Expected Future	She currently earns \$1 million per year as a broadcaster. She plans on retiring in four years. With typical raises in her industry, she estimates that the present value of her pre-retirement income is \$4.5 million.
Employment	
Income	
Financial Assets and Liabilities	She has an investment portfolio worth \$8 million, which consists of 30% equities and the remainder in fixed-income securities. She also owns \$1 million in shares of the broadcasting company she works for, but she is restricted from selling them for two more years. Her primary residence carries no mortgage and was recently valued at \$2 million. She also owns a vacation property worth \$3 million, with an outstanding mortgage of \$1 million. Her defined-contribution pension plan has vested and is valued at \$2.5 million.

Aspirational Goals and Extended Liabilities	<p>Everett is just beginning university and plans to pursue a medical degree. Lennon plans on paying for his entire education and living expenses as well as providing some assistance in funding his future practice. She believes that these goals will be covered with \$1.5 million in present value terms.</p> <p>She has begun the process of setting up a special needs trust to provide lifetime benefits for Marshall that will not interfere with the government benefits that he is eligible to receive. It will be funded with \$2 million within the year.</p> <p>She recently received an honorary doctorate from her alma mater and has started the process of endowing a chair in its communications department. She anticipates that the funding will be made available to the university in two years; it has a present value of \$1.75 million.</p> <p>The present value of future consumption is estimated to be \$9 million.</p>
Risk Tolerance	<p>In the past, she has had a tendency to sell winning investments to avoid the risk of giving back gains. She also has had a tendency to retain losing investments even when there is little chance of them recovering in value.</p>

Fox told the candidates to assume that Lennon would use sub-portfolios to achieve her aspirational goals and asked them to identify which of the sub-portfolios is in the best position to tolerate the greatest risk exposure.

In reviewing Lennon's risk tolerance, Fox pointed out that Lennon's prior investment experience clearly indicates some behavioral biases that would influence her reaction to any asset allocation proposals.

Fox reminded the candidates that in addition to high-net-worth individuals, the firm's client base also includes various institutional investors. The candidates made the following statements:

Trainor: A goals-based approach to asset allocation is appropriate for individual investors, but institutions need to focus either on the asset or liability side of the balance sheet, depending on the nature of their business.

Kelly: A typical objective of some institutions is to maximize their Sharpe ratio for an acceptable level of volatility, and they rely on the law of large numbers to assist them in modeling their liabilities. Other institutions behave much like individuals by segmenting general account assets into sub-portfolios associated with specific lines of business with their individual return objectives.

Fox mentioned to the candidates that when dealing with strategic asset allocation, investors often had difficulty understanding the relevant characteristics of asset classes. They responded:

Kelly: I like to stress to clients that asset classes should have high within-group correlations but low correlations with other classes. In addition, because investors need to rebalance to a strategic asset allocation, asset classes need to have both sufficient liquidity and low transaction costs.

Trainor: It is important that asset classes should be diversifying. I always look for low pairwise correlations with other asset classes.

Other general comments were noted about asset classes, but Fox could not recall their sources:

- Emerging market equities should not be considered a separate asset class from global equities.
- Asset classes differ from strategies in offering a non-skill-based ex ante expected return premium.
- Asset classes should be defined in such a way that there is no overlap in sources of risk.

1. Based on the information in Exhibit 1, Lennon's economic net worth (in \$ millions) is closest to:
 - A. 4.75.
 - B. 5.75.
 - C. 1.25.
2. Which of the sub-portfolios dedicated to Lennon's aspirational goals is in the best position to tolerate the greatest risk exposure? The one dedicated to:
 - A. Everett's education
 - B. Marshall's trust
 - C. University endowment
3. The behavioral bias that Lennon's past investment experience illustrates is best described as:
 - A. self-control bias.
 - B. mental accounting bias.
 - C. loss-aversion bias.
4. The most appropriate statement in regards to approaches to asset allocation by institutions is made by:
 - A. Kelly, regarding their goals-based allocations.
 - B. Trainor.
 - C. Kelly, regarding the Sharpe ratio and modeling of liabilities.

5. In the candidates' responses to Fox regarding the relevant characteristics of asset classes, the statement that is least accurate is:
 - A. Kelly's regarding correlations.
 - B. Trainor's.
 - C. Kelly's regarding rebalancing.

6. In the general comments about asset classes that Fox noted, the most accurate comment is the one regarding:
 - A. the overlap of sources of risk.
 - B. emerging markets.
 - C. the return premiums from asset classes.

Case 2: Kohler

The Kohler Family Foundation, an entity not subject to taxes, partially supports the financing of annual operating expenses for Kohler College. In addition to these annual costs, the Foundation has just committed itself to partially fund five different campus building renovation projects over the next 15 years, including student housing renovations in three dormitories and the expansion of classroom wings in two academic buildings.

Because of these new financial commitments, the Foundation's investment committee, chaired by Frederick Schumacher, has decided to engage ECU Investment Management for advice on changing the Foundation's portfolio asset allocation.

Thomas Roth, CFA, a senior investment consultant at ECU, conducts an introductory meeting with Schumacher to examine the Foundation's asset allocation.

Schumacher explains to Roth:

"Our investment committee has discussed the necessity for changes to our approach to strategic asset allocation. We believe that these three standards should drive the Foundation's strategic asset allocation and we want your opinion of them:

Standard 1: Our allocation should include long-term exposures to the systematic risks of the various asset classes.

Standard 2: Asset class weights should satisfy our investment objectives and constraints.

Standard 3: Perceived disequilibriums in markets in a given period should affect our asset weightings in the subsequent period."

Roth states: "Your future building renovation projects indicate that an asset/liability management (ALM) approach to the Foundation's strategic asset allocation would be appropriate. ALM seeks to adopt the optimal asset allocation in relationship to funding financial obligations."

Schumacher replies:

"That seems to be an intelligent suggestion. I imagine the following three outcomes would result from adopting that approach:

Outcome 1: We would have a higher allocation to fixed income.

Outcome 2: The global market equilibrium portfolio would be our default asset allocation to which we would make adjustments to meet our future liabilities.

Outcome 3: Portfolio risk control related to our future spending needs would likely not be very precise."

Roth inquires: "Can you explain how the Foundation has approached asset allocation in the past? I would also like to understand your asset class specification methods."

Schumacher explains: "Historically, our portfolio has comprised a diversified collection of domestic large-cap equities. We now believe we should diversify into additional asset classes,

such as domestic mid-cap and small-cap equities. I have listed the asset classes we are considering in Exhibit 1 for your review.”

Exhibit 1								
Asset Class Correlations and 12-Month Sharpe Ratios								
	Asset class	Large cap	Mid cap	Small cap	Agricultural Commodities Index	All Commodities Index	Municipal bonds	Sharpe ratio
1	Large cap	1						2.31
2	Mid cap	0.992	1					2.1
3	Small cap	0.978	0.983	1				2.54
4	Agricultural Commodities Index	0.112	0.112	0.094	1			0.998
5	All Commodities Index	0.102	0.095	0.085	0.553	1		0.026
6	Taxable municipal bonds	0.109	0.119	0.117	0.108	0.146	1	-0.055

Schumacher observes: “Asset classes 4, 5, and 6 all have low correlations with equities. For diversification purposes, does it really make a difference which one we add?”

Roth comments: “We believe the addition of asset classes to your existing equity portfolio should be done with the goal of achieving a mean–variance improvement when including the new asset class. The Foundation should invest a major portion of the portfolio internationally, diversified across asset classes. As an example, our ECU Global Tactical Allocation Fund invests in non-US dollar (USD) equities, fixed income, and real estate, as well as in real return assets, such as commodities. The primary inputs to our tactical asset allocation decisions are a long-term outlook for the next three to five years and a six-month short-term forecast for each asset class. The weighted foreign currency exposure of our equities and fixed income mirrors the US Dollar Index, and we value our real estate and real return assets in USD. Exhibit 2 shows our fund’s strategic asset allocation weightings plus investment return and currency forecasts.”

Exhibit 2			
ECU Global Tactical Allocation Fund			
Asset class	Asset weightings	LT Outlook	ST Forecast
Developed market equities	55%	9.00%	12%
Developed market fixed income	25%	3.00%	0%

International real estate	10%	11.00%	12%
Real return assets	15%	4.00%	7%

Note: Short-term US Dollar Index forecast versus weighted currencies in portfolio: +3%.

Schumacher says: "I have the following three concerns with respect to investing internationally:

Concern 1: In times of market stress, diversification benefits can be drastically reduced.

Concern 2: Capital in some countries does not flow freely across borders, which can result in increased market segmentation.

Concern 3: Traditional mean-variance analysis may not apply."

Roth replies: "Your concerns pertain to conditional correlation, market integration, and the efficient frontier; however, they are not all necessarily disadvantages."

1. Which of the Kohler Foundation investment committee's three standards is least consistent with strategic asset allocation?
 - A. Standard 3
 - B. Standard 2
 - C. Standard 1

2. Which of Schumacher's three outcomes is most likely consistent with the ALM approach?
 - A. Outcome 1
 - B. Outcome 3
 - C. Outcome 2

3. When evaluating the asset classes in Exhibit 1, Roth would most likely criticize the specification of which of the following asset classes?
 - A. Mid cap equities
 - B. Taxable municipal bonds
 - C. All Commodities Index

4. Based on the information contained in Exhibit 1 and mean-variance analysis, Roth is least likely to improve the Foundation's portfolio by the inclusion of:
 - A. taxable municipal bonds.
 - B. the Agricultural Commodities Index.
 - C. the All Commodities Index.

5. Based on the return and currency forecasts in Exhibit 2, ECU's tactical asset allocation shifts would most likely increase weightings in:

- A. real estate and real return assets and decrease equities and fixed income.
 - B. fixed income and real return assets and decrease equities and real estate.
 - C. equities and real return assets and decrease fixed income.
6. Schumacher's concern about international investments that Roth might find advantageous most likely pertains to:
- A. conditional correlation.
 - B. the efficient frontier.
 - C. market integration.

Case 3: Kirsch

Penproact Corp. is a 50-year-old industrial manufacturer that sponsors a defined benefit pension plan for its employees. Jason Kirsch, CEO, is meeting with Doug Erickson, an investment consultant for Favre Capital Management. Favre has been the plan's consultant for the past 15 years and specializes in asset allocation for clients with long-term liabilities.

Kirsch prepares for the meeting by reviewing the pension plan's investment policy, focusing on the plan's investment framework and economic liability. He asks Erickson whether the plan's risk objective addresses the plan's exposure to economic and capital market factors. Erickson replies that the investment policy addresses the plan's risk by defining low-risk investments as assets that have low correlations in the context of an investment portfolio.

The plan's investment returns are measured against an investment benchmark composed of equity, fixed-income, and cash instruments. Erickson states that the plan's funded status is protected from an economic-liability perspective because of the inclusion of fixed-income and cash instruments in the benchmark and because the plan's low-risk investment assets have a high correlation with the liabilities. The characteristics of the plan assets and the plan liabilities are provided in Exhibit 1.

Exhibit 1		
Penproact's Defined Benefit Pension Plan		
Liabilities (\$ million)	100	
Assets (\$ million)	90	
Participants	1,000	Active employees
Inactive participants	250	Retired and terminated employees
Frozen	No	
Closed	Yes	
Indexed to inflation	Yes	Active employees only
Wage inflation	2%	Year over year long term assumption
GDP growth	2%	Year over year long term assumption
Real wage growth	2%	Year over year long term assumption

Kirsch questions whether the plan's investment policy is adequate. He shares his belief that the risk orientation of the plan should focus on market-related exposures for both the plan assets and the plan liabilities. Erickson suggests that they work together to develop a custom benchmark that mimics the pension liabilities. This benchmark would be used to measure the investment portfolio's performance. The plan's current asset allocation is 60% equities, 25% nominal bonds, and 15% real rate bonds. Erickson states that one important objective is to maintain or improve the plan's funded status. Because of operating cash flow constraints, Penproact also wants to avoid being required to contribute additional funds to the plan.

Regarding the future asset allocation, Erickson offers the following strategies for discussion:

Strategy 1: Modify the current asset allocation to include 90% equities and 10% bonds to offset future service costs and to improve the plan's funded status.

Strategy 2: Invest in a portfolio of 100% bonds that is expected to outperform the benchmark.

Strategy 3: Use a combination of interest rate derivatives and bonds to hedge the term structure exposure of the liability and invest in equities to generate excess returns.

1. The current investment framework for Penproact's pension plan as it relates to the plan's risk most likely focuses on only the:
 - A. funded status.
 - B. economic liability.
 - C. assets.

2. Is Erickson's comment regarding funded status most likely correct with respect to the plan having a liability-relative perspective?
 - A. No, because of the investment asset's correlation with the pension liabilities
 - B. No, because of the investment benchmark
 - C. Yes

3. Based on Exhibit 1, the plan assets that are expected to mimic the plan liabilities pertaining to inactive participants are most likely:
 - A. nominal bonds.
 - B. equities.
 - C. real rate bonds.

4. Based on Exhibit 1, the amount of wage growth the selected benchmark is expected to cover is closest to:
 - A. 4%.
 - B. 6%.
 - C. 2%.

5. The combination of assets expected to mimic plan liabilities pertaining to active participants is most likely:
 - A. nominal bonds and equities.
 - B. equities, real rate bonds, nominal bonds.
 - C. real rate bonds and nominal bonds.

6. Based on Kirsch and Erickson's objectives for the plan, which asset allocation strategy is most likely appropriate?
 - A. Strategy 1
 - B. Strategy 3
 - C. Strategy 2

Case 4: Campos

Marina Campos is a senior portfolio manager for Sabanai Investimentos in Sao Paulo, Brazil. Sabanai provides investment management and advisory services for high-net-worth and institutional clients. She is assisted by two portfolio analysts, Fabiana Traldi and Pedro Peixaria. Campos is meeting with Traldi and Peixaria to discuss the portfolios of three clients. The first client is Gilvan Araujo Dias, a high-net-worth client who has given Sabanai responsibility for managing his foreign investments, which consist of equity investments in the United Kingdom and Germany. His other assets consist of equity and corporate bond investments in Brazil. Exhibit 1 summarizes information on Dias's foreign portfolio holdings and exchange rates.

Exhibit 1				
Gilvan Araujo Dias				
Information on Foreign Asset Holdings and Exchange Rates				
Date	UK Assets	German Assets	Spot Exchange Rates	
	Value in GBP	Value in EUR	BRL/GBP	BRL/EUR
1/1/2013	83,400,000	55,000,000	3.8729	3.0359
1/1/2014	86,000,000	51,000,000	4.1025	3.5142

Dias has asked whether it would be appropriate for him to hedge his foreign currency exposure. Campos raises the issue with Traldi and Peixaria. Traldi responds, "In the short run, if the correlation between foreign asset returns and foreign currency returns is negative, then there may be a need to hedge all foreign currency exposure. Alternatively, one could implement a currency overlay program in which the currency exposure is fully hedged and currency alpha is generated separately. This currency overlay strategy will only be successful in adding value to the portfolio if the currency alpha has a high correlation with Brazilian equities and corporate bonds."

The second client, BC Fundos de Pensao (BC), manages pension funds for numerous local companies and has currency exposure to the USD, the EUR, and the GBP. BC wants Sabanai to provide guidance on using active currency management strategies for the portfolios they manage. Peixaria has been assigned this task and has collected information on one-year yield levels in the United States, United Kingdom, and Eurozone, as well as one-year implied volatility for various currency pairs extracted from option pricing models. This information is provided in Exhibit 2.

Exhibit 2	
One-Year Yield Levels and Implied Volatilities	
Panel A	
Country	One-Year Yield
United States	0.05%

United Kingdom	0.40%
Eurozone	0.11%
Panel B	
Currency Pair	One-Year Implied Volatility
USD/GBP	5.50%
GBP/EUR	7.50%
USD/EUR	9.50%

Peixaria indicates that his research suggests that the USD/EUR currency pair will become more volatile over the near term. He recommends that BC implement an options-based strategy using USD/EUR options to profit from the expected increase in volatility.

The third client is Fundo do Brasil (FB), a Brazilian sovereign wealth fund. FB has long equity positions in Australian and Swiss equities. Spot and forward market currency information for AUD and CHF is provided in Exhibit 3. FB managers have asked Campos for advice on whether it would be appropriate to hedge the currency exposure with forward contracts in AUD and CHF. Campos indicates she will examine the use of forward contracts to hedge currency exposure.

Exhibit 3			
Spot and Forward Rates for AUD and CHF			
Currency Pair	Current Spot Rate	Six-Month Forward Rate	Six-Month Forecast Spot Rate
BRL/AUD	2.1046	2.1523	2.0355
BRL/CHF	2.5309	2.4641	2.5642

Traldi suggests that the use of put options might be a better way to hedge currency exposure. Campos responds that there are better options-based strategies that can exploit market views and reduce hedging costs. She suggests the following strategies:

Strategy 1. For AUD exposure, the appropriate strategy is to be long put options at a strike price of 2.1046, short put options with a strike price 2.1356, and short call options with a strike price of 2.1456.

Strategy 2. For CHF exposure, the appropriate strategy is to be long put options at a strike price of 2.5309, short put options with a strike price 2.5049, and short call options with a strike price of 2.5669.

1. Based on the information provided in Exhibit 1, the domestic currency value of Dias's foreign investments most likely:
 - A. decreased because of changes in the domestic currency value of foreign asset holdings.
 - B. increased because of changes in the domestic currency value of UK assets but decreased because of changes in the domestic currency value of German assets.

- C. increased because of changes in the domestic currency value of foreign asset holdings.
2. In her response regarding hedging foreign currency exposure in Dias's portfolio, Traldi is most likely:
- correct about the correlations and the currency overlay program.
 - incorrect about the correlations, but correct about the currency overlay program.
 - incorrect about the correlations and the currency overlay program.
3. Based on the information in Exhibit 2, it would be best for Sabanai to implement a carry trade for BC by borrowing in:
- GBP and investing in USD.
 - USD and investing in GBP.
 - EUR and investing in GBP.
4. In regard to using USD/EUR options, Peixaria is least likely to recommend a strategy to go:
- short an equal number of 15-delta puts and calls.
 - long an equal number of 25-delta puts and calls.
 - long an equal number of 50-delta puts and calls.
5. Based on the information provided in Exhibit 3, the most appropriate risk neutral strategy is for FB to:
- under-hedge AUD and over-hedge CHF.
 - over-hedge AUD and not hedge CHF.
 - under-hedge CHF and not hedge AUD.
6. Is Campos most likely correct that Strategy 1 and Strategy 2 will accomplish the goals of exploiting market views and reducing hedging costs?
- No, she is incorrect about reducing hedging costs
 - Yes
 - No, she is incorrect about exploiting market views

Case 5: Noir Rashwan

The Azur fund is a sovereign wealth fund valued at USD792 billion located in the country of Azurbikan. Azurbikan is a member of OPEC petroleum exporting countries with the main funding source of the fund being oil exports.

Noir Rashwan, CFA, is the managing director of the fund and is currently meeting with the board of directors of the fund, consisting of representatives from various government departments, business leaders, and other stakeholders. Her agenda is to discuss concerns regarding low oil prices and how that affects the country's wealth in its concentrated position in oil, a proposed change to the fund's strategic asset allocation to increase the overall return of the fund in response to the low price of oil, and divestiture of some real estate assets to capture gains.

Rashwan first presents the current and proposed asset allocations shown below.

	Current Asset Allocation	Proposed asset Allocation
Cash		4%
Domestic government bonds	20%	1%
Domestic corporate bonds	10%	2%
Global bonds	10%	2%
Domestic equity	35%	9%
Global equities	10%	12%
Real estate	15%	10%
Infrastructure		10%
Hedge funds		17%
Private equity		33%

She explains to the board of directors that since the fund has low liquidity needs the proposed strategic asset allocation will allow the skilled submanagers to add value through active management of the non-traditional assets.

In 2008, many of the fund's foreign investments that were purchased at the peak of the real estate market lost substantial amounts of value. Some of those real estate values have since rebounded and are currently above the purchase price. Rashwan proposes to sell the fund's USD 100 million stake in a hotel located in the United States in South Beach Miami. Zein Minkara, president of a major pharmaceutical company, states, "We should sell now to lock in the gains, avoiding the substantial and painful losses that many of our real estate holdings experienced during the last global recession." The hotel property value has a pre-tax standard deviation of 13% and would be subject to a 20% capital gains tax.

Regarding the low price of oil, Jamal Zayat, Sultan of Azurbikan, states, "Since we're part of OPEC, a consortium of oil exporting nations, we should agree to restrict the world supply of oil, thus

propping up its price as we've been able to do in the past." Siham Atallah, chairman of the central bank of Azurbikan, discusses changes in the economic environment of oil production putting downward pressure on oil prices. These changes include reduced demand in gasoline through greater fuel efficient cars, weak economies of Europe and developing countries, and the development of new technologies allowing countries to extract oil and natural gas from areas that were once unprofitable.

Atallah ends with a summary of short-term capital market expectations:

- "Overall global GDP is expected to grow at a moderate pace,
- the yield curve is expected to flatten with short-term rates increasing while long-term rates remain steady,
- yield spreads are exceedingly high, and
- global real estate values are showing signs of overvaluation in some markets."

1. Which of the following statements regarding the proposed change in strategic asset allocation for the Azur fund is least accurate?
 - A. Due to the large size of the fund, it may not be possible to find enough alternative investments to meet the proposed strategic asset allocation.
 - B. The percent allocated to alternative investments is acceptable given the low liquidity needs, long time horizon, and desire for increased return.
 - C. The proposed asset allocation is too heavily weighted towards non-traditional assets with not enough exposure towards more traditional bond and equity investments.
2. The behavioral bias displayed by Minkara, the president of the pharmaceutical company, is most likely described as:
 - A. recency bias.
 - B. loss aversion.
 - C. mental accounting.
3. The after-tax standard deviation on the sale of the USD 100 million stake in the hotel is closest to:
 - A. 10.4%.
 - B. 13.6%.
 - C. 16.3%.
4. After implementing the new strategic asset allocation, the pre-tax rebalancing range for real estate is now 5% to 15%. The after-tax rebalancing range for the sovereign wealth fund's

allocation to real estate is closest to:

- A. 7.25% to 12.75%.
 - B. 5.00% to 15.00%.
 - C. 3.75% to 16.25%.
5. The statements made by the Sultan regarding reducing the supply of oil reflect which behavioral bias?
- A. Framing.
 - B. Home bias.
 - C. Illusion of control.
6. Based on the short-term capital market expectations, which of the following tactical asset allocations would least likely be implemented?
- A. Increase high yield bonds and reduce real estate.
 - B. Decrease long-term bonds and reduce real estate.
 - C. Increase equities and increase corporate bonds.

4. SS11 Alternatives

Case 1: Marion Knight Scenario

Marion Knight is a Swiss-based wealth manager who offers discretionary portfolio management services to high net worth individuals. She believes that the portfolios of a number of her clients would benefit from investments in hedge funds. Knight has discussed the relative merits of hedge fund investing with four clients and has received their approval to add this asset class to their portfolios, subject to agreed upon investment criteria. Knight consults the notes that she has made during her conversations with these clients.

Client 1 prefers a hedge fund strategy that uses top-down analysis in a broad range of securities markets, taking positions that are thematic or directional. Markets can be valued using macroeconomic and fundamental analysis, and the hedge fund strategy is typically implemented using discretionary trading. Knight also notes that this client has a high tolerance for investment risk.

Client 2 has given Knight a mandate to invest in event-driven strategies only. Knight's notes on event-driven strategies include the following statements.

Statement 1: Distressed security investing generally uses high levels of leverage.

Statement 2: A merger arbitrage strategy is analogous to writing insurance on the acquisition.

Statement 3: A hard-catalyst event-driven strategy tends to be riskier and more volatile than a soft-catalyst strategy.

Client 3 has expressed a preference for multi-strategy funds instead of fund-of-funds for the following reasons:

Reason 1: Multi-strategy funds can reallocate funds into different strategy areas more quickly and easily compared to a fund-of-funds.

Reason 2: The fee structure of multi-strategy funds is often more attractive than that of a fund-of-funds.

Client 4 wants to add a volatility trading strategy as a portfolio diversifier and has specified that the strategy must be highly liquid. Knight's notes indicate that there are multiple ways of implementing a volatility trading strategy; although, some strategies offer more liquidity than others.

1. The most appropriate hedge fund strategy for Client 1 is:
 - A. a global macro strategy.
 - B. a managed futures strategy.
 - C. a dedicated short-selling strategy.

2. Which of Knight's statements is correct?
 - A. Statement 1.
 - B. Statement 2.
 - C. Statement 3.

3. Which of Client 3's reasons for preferring multi-strategy funds over a fund-of-funds is correct?
 - A. Only Reason 1.
 - B. Only Reason 2.
 - C. Both Reasons 1 and 2.

4. Which of the following volatility trading strategies is most likely to meet Client 4's liquidity preference?
 - A. VIX index futures.
 - B. OTC variance swaps.
 - C. OTC volatility swaps.

Case 2: Jake Montana Scenario

Jake Montana, age 45, is a high net worth individual. Montana has just sold the company that he founded when he was 22 and wants to review his investment portfolio. He contacts Sarah Kelce, his investment advisor of 10 years, to seek her advice about the suitability of alternative investments for his portfolio. Montana's portfolio is currently invested in liquid stocks and bonds in accordance with his investment objectives prior to the sale of his company. He now wants to enhance the capital growth of his portfolio, even if that means investing in less liquid assets.

Montana is relatively familiar with commercial real estate and private equity investments. He asks Kelce if there are other types of alternative investments that would enable his portfolio to benefit primarily from capital growth and inflation-hedging. Kelce replies that the alternative investments universe is very broad and includes hedge funds, private credit, and private real assets. She is certain she could recommend a strategy from these three types of alternative investments to meet Montana's requirements.

As Montana is considering an investment in alternative investments for the first time, Kelce uses a traditional approach to defining the opportunity set for asset allocation based on asset class liquidity. Kelce mentions that investors are increasingly turning to risk factor-based asset allocation approaches when incorporating alternative investments into their portfolios although these approaches also have their limitations.

Kelce has primarily used mean-variance optimization (MVO) to manage Montana's portfolio asset allocations over the last 10 years. She tells Montana that relying solely on MVO for portfolio asset allocation with alternative investments may cause over allocation to this asset class. As a result, she may need to specify minimum and maximum weights for different asset classes when running an MVO for Montana's portfolio asset allocation, when including alternative investments. Montana asks Kelce how the performance of an alternative investments strategy for his portfolio will be evaluated. Kelce acknowledges that benchmarking an alternative investments strategy can be a challenging exercise and makes the following two statements.

Statement 1: A custom index proxy is unlikely to have the same risk-return characteristics of the actual alternative investments strategy.

Statement 2: Peer group comparisons of an alternative investments strategy are more useful because existing providers of these benchmarks have agreed to follow the same benchmark construction rules.

1. In response to Montana's question about an alternative investments strategy, Kelce is most likely to recommend:
 - A. a timber investment.
 - B. a long or short equity strategy.

- C. a distressed debt investment.
- 2. Which of the following is a limitation of the risk factor-based approach when defining the opportunity set for asset allocation?
 - A. Liquidity risk exposure cannot be identified.
 - B. Risk factor exposures can change over time.
 - C. Portfolio diversification can be over-estimated.
- 3. The efficient frontier obtained using MVO with minimum and maximum weights for the different asset classes is most likely to:
 - A. lie above that obtained using unconstrained MVO.
 - B. lie below that obtained using unconstrained MVO.
 - C. be the same as that obtained using unconstrained MVO.
- 4. How many of Kelce's statements are correct?
 - A. None.
 - B. One.
 - C. Two.

5. SS15 Trading, Performance Evaluation, and Manager Selection

Case 1: Ahmed

Nadia Ahmed is the head trader for Tweed Asset Management (Tweed) based in London, England. She is reviewing some of the trade requests the desk has received from its personal and institutional portfolio managers and is deciding on what tactics to recommend.

Ahmed starts by reviewing the trade requests from one of Tweed's personal portfolio managers, Edwin Moore. She passes the requests along to Vladimir Norsk, one of the firm's traders. The first trade Ahmed asks Norsk to execute is a purchase of 2,000 shares of BDF Ltd., which trades on the SEAQ, London's dealer market for infrequently traded shares. Norsk reviews the current limit order book for BDF shown in Exhibit 1.

Exhibit 1					
Limit Order Book for BDF at 11:15:08					
Bid			Ask		
Dealer	Price	Size	Dealer	Price	Size
C	£15.42	800	B	£15.48	1,800
B	£15.38	2,000	A	£15.50	1,000
A	£15.36	500	C	£15.52	600

Norsk was able to fill the order for BDF during the day by executing the trades shown in Exhibit 2.

Exhibit 2						
Execution of BDF Purchase						
Time of Trade	Trade Size	Trade Price	Ask Price	Ask Size	Bid Price	Bid Size
11:15:09	1,500	£15.46	£15.48	1,500	£15.38	2,000
12:20:30	500	£15.50	£15.52	1,000	£15.36	500

The next request that Ahmed reviews is for the purchase of 300,000 shares of WWT pie from a client who is quite concerned about price execution. She reviews the trading volumes from the previous day (Exhibit 3) and, prepares her recommendation on the trade.

Exhibit 3				
Selected Trading Information London Stock Exchange				
Stock	Average Daily Volume (ADV)	Previous Day Price History		
		High	Low	Close
WWT	450,000	£12.50	£12.43	£12.48
JAK	2,000,000	£25.80	£24.20	£25.50

The final order from Moore that Ahmed asks Norsk to execute is a purchase of 1,000 shares of JAK pie with a limit order of £25.00 good for the day.

Norsk was unsuccessful in filling the limit order on the first day and after consultation with the

client they agree to revise the price. Two days later Norsk successfully purchases 800 shares of JAK at £26.25 with commission costs of £135.00. Moore decides to cancel the order for the remaining 200 shares when the shares close that day at £26.75.

Moore and Ahmed discuss the implementation shortfall from the investment in JAK, based on the \$25.50 closing price in Exhibit 3, and Moore makes the following statement:

I know that market movement is a factor in the implementation shortfall. Because market movement is beyond Norsk's control, when assessing his performance, we should adjust the calculation to only include the commission costs and the missed trading opportunity for the 200 shares.

1. The implementation shortfall, in basis points, on the purchase of the JAK shares is closest to:
 - A. 360.
 - B. 386.
 - C. 332.

2. Moore's statement about assessing the trader's performance is best described as:
 - A. incorrect, as only commission costs should be included.
 - B. correct.
 - C. incorrect, as delay costs should also be included.

3. Which of the three trades reviewed by Ahmed would best be handled via direct market access? The trade concerning:
 - A. JAK
 - B. WWT
 - C. BDF

Case 2: Lancaster

Carol Lancaster of Trident Funds is discussing portfolio performance evaluation with a new employee, Mary Clark. Clark asks Lancaster why there is a preference for using a time-weighted rate of return (TWR) instead of a money-weighted rate of return (MWR). Lancaster informs Clark that MWR always has an upward bias relative TWR whenever the fund receives large contributions during a particular period. Consequently, TWR is the preferred metric.

Clark also asks Lancaster about the strict appraisal criteria used to evaluate the different managers employed by the Fund. Lancaster states, "The Fund is willing to risk firing good managers, a Type II error, in order to prevent retaining poor managers, a Type I error. But I would prefer if the Fund would relax the appraisal criteria."

Lancaster then introduces Clark to a typical micro attribution model used by the Fund to evaluate a manager's ability using the information in Exhibit 1.

Exhibit 1				
Micro Attribution Model Data				
Economic Sector:	Portfolio Weight (%):	Sector Benchmark Weight (%):	Portfolio Return (%):	Sector Benchmark Return (%):
Sector 1:	15	10	1.16	0.82
Sector 2:	25	25	1.69	2.31
Sector 3:	40	30	-0.62	-0.38
Sector 4:	14	15	4.98	2.95
Sector 5:	5	20	3.10	0.69
Cash:	1	0	0.45	---
Buy/hold Return:			1.21	1.13
Trading / other Costs:			-0.04	0.00
Total Return:			1.17	1.13

The value-added return produced by the manager is segmented into: a pure sector allocation return, a within sector allocation return, and an allocation/selection interaction return. Lancaster states that each portion of the value-added return is examined, but that particular emphasis is placed upon the within sector allocation return because it strictly measures the manager's ability to select securities.

1. Lancaster's statement about the money-weighted rate of return (MWR) is most likely:
 - A. Correct.
 - B. Incorrect, because the MWR is always equivalent to the time-weighted rate of return (TWR).
 - C. Incorrect, because the MWR can have downward and upward bias relative to the

time-weighted rate of return (TWR).

2. If the Fund adopted Lancaster's preferred appraisal criteria, the most likely impact would be an increase in:
 - A. Type I error only.
 - B. Type II error only.
 - C. Both types of errors.
3. The pure sector allocation return (%) for Sector 1 is closest to:
 - A. -0.05.
 - B. -0.02.
 - C. 0.02.
4. The within sector allocation return (%) for Sector 3 is closest to:
 - A. -0.10.
 - B. -0.07.
 - C. -0.02.
5. The allocation/selection interaction return (%) for Sector 5 is closest to:
 - A. -0.36.
 - B. -0.30.
 - C. 0.48.
6. Lancaster's statement about the within sector allocation return is most likely:
 - A. Correct.
 - B. Incorrect, because only the manager's portfolio weighting of securities within the sector is considered.
 - C. Incorrect, because the manager's portfolio weighting and security selection within the sector are both considered.

Case 3: Subramanium

Asis Subramanium was recently hired by the pension fund Nash, Barwich, and Stuart (NBS) as a Portfolio Performance Evaluation Specialist. NBS does not have a formal performance evaluation policy and Dev Radia, Director of Portfolio Management, asks Subramanium to develop such a policy for the firm.

Collecting research related to performance evaluation, Subramanium tells Radia that a performance evaluation policy should address the following three major issues:

1. Performance measurement defined as the calculation of the rates of return based on investment-related changes in an account's value over specified time periods;
2. Performance attribution which investigates the sources of the account's performance relative to a manager's past performance and the importance of those sources; and
3. Performance appraisal which attempts to answer the question whether the account's performance is due to luck or skill.

The two start their discussion of other issues relating to performance evaluation by comparing time-weighted return (TWR) to money-weighted return (MWR). Subramanium provides an example of the two methods using the recent month's history of the West Riverdale Defined Benefit Plan. As indicated in Exhibit 1, the start of month value of the plan was \$20,000,000. The portfolio is revalued whenever a cash flow arises and all daily cash flows occur at the end of the stated day, e.g., on the eighth day into the month the account received a contribution of \$200,000 and had an end of the day value of \$21,200,000. At the end of the month (day 30), the terminal value of the account was \$20,255,000.

Exhibit 1		
West Riverdale Defined Benefit Plan Recent month's history		
Day	Contributions (+) and Withdrawals (-) (\$)	Market Value Post Cash Flow (\$)
0		20,000,000
8	200,000	21,200,000
11	-250,000	20,025,000
22	180,000	20,300,000
30		20,255,000

Radia picks up the discussion at this point, saying, "Having calculated TWR and/or MWR, one needs a benchmark against which the account return can be compared. Many issues arise in this choice of a benchmark." Radia points out three:

1. Consultants and fund sponsors frequently use the median manager or fund from a broad universe of managers or funds as a performance evaluation benchmark. This approach is flawed, as it fails the test of being measurable.

2. A drawback of a style index is that the definition of investment style implied in the benchmark may be inconsistent with the investment process of the manager.
3. The absolute return objective is generally the preferred approach.

The two move on to consider performance evaluation of hedge funds and agree that hedge fund performance can be especially difficult to evaluate. They provide three reasons why this is so:

1. If the hedge fund consists of a long-short portfolio which nets to an initial market value of zero, the rate of return on the portfolio would be undefined, approaching either positive infinity or negative infinity due to this division by zero problem.
2. Even when the hedge fund's assets do not net to zero, the vagueness of defining "hedge funds" makes it difficult to assign specific benchmarks.
3. The option-like features of many hedge funds make the use of the Sharpe ratio a preferred approach to performance measurement.

The two agree that investment skill requires a manager to outperform an appropriate benchmark, on average over time, and on a risk-adjusted basis. Commonly used measures that adjust for risk are the Treynor measure, the Sharpe ratio, and M^2 . To demonstrate the differences between these three measures, Subramanium collects the data given in Exhibit 2 along with his partially completed calculations on three accounts.

Exhibit 2						
Data Relating to Common Risk-Adjustment Tools						
Account	Average Asset Return	Standard Deviation of Asset Returns	Ex Post Beta of the Asset	M^2	Sharpe Ratio	Treynor Measure
W-Life	15%	22%	1.35	0.11	0.5	
Lee Co	9%	6%	1.05		0.83	4.76
G. Ltd	8%	7%	0.85	0.12		4.71
Market Data:						
Average Risk-free Return					4%	
Average Return on the Market					12%	
Standard Deviation of the Market Return					14%	

Finally, Radia asks Subramanium if there are any issues to be considered regarding manager continuation policy. Subramanium answers that there are two types of mistakes you can make:

- one mistake is to fire (or not hire) a manager with positive value-added management;
- a second mistake is to keep (or hire) managers that provide zero value-added.

1. In describing the three major issues relating to a performance evaluation policy, Subramanium is least accurate with respect to performance:

- A. management.
 - B. attribution.
 - C. appraisal.
2. Which of Radia's points regarding the choice of a benchmark is the most accurate? His point regarding the:
- A. median manager or fund.
 - B. absolute return objective.
 - C. style index.
3. Which of Subramanium's and Radia's reasons as to why hedge funds are difficult to evaluate is the least accurate? The statement regarding:
- A. undefined rate of return.
 - B. vagueness of definition.
 - C. option-like features.
4. Using the data in Exhibit 2, the account which has produced the highest return per unit of systematic risk is:
- A. Lee Co.
 - B. G. Ltd.
 - C. W-Life.
5. Subramanium's answers to Radia's question regarding manager continuation policy best describes a Type I error for:
- A. both statements.
 - B. the second statement and a Type II error for the first statement.
 - C. the first statement and a Type II error for the second statement.

Case 4: Andrews

Downing Funds (DF) provides investment opportunities for clients by creating funds that invest in a mix of other existing funds. Claire Andrews evaluates the managers of funds in which DF currently invests and the managers of funds that may create future investment opportunities for DF.

Currently, Andrews is considering the performance of the BITR3 fund with some limited information, shown in Exhibit 1.

Exhibit 1			
One Month of Fund Performance for BITR3 Fund (in € millions)			
Day	Fund Value	Contribution/ (Withdrawal)	Fund Value with Contributions
0	9.5	0	9.5
10	9.8	-2.5	7.3
25	8	1.5	9.5
30	9.6	0	9.6
Rates of return	Time-weighted (TWR): 14.24%	Money-weighted (MWR): 13.57%	

Andrews also receives incomplete attribution information for another fund, EATR7, shown in Exhibit 2. Similar to the BITR3 fund, the EATR7 fund may have some future investment potential. She requests that her analyst, Ted Kukar, complete the analysis.

Exhibit 2			
EATR7 Fund Attribution Information (in \$ millions)			
Investment Alternative	Fund Value	Incremental Return Contribution	Incremental Value Contribution
Beginning value	104.56		
Net contributions	105.77	0.00%	1.21
Risk-free asset	107.72		1.95
Asset category	115.7		7.98
Benchmarks	116.23		0.53
Investment managers	118.55		2.32
Allocation effects	120.33		1.78
Total fund	120.33		15.77

Kukar tells Andrews that he has heard that the EATR7 fund generates a portion of its return from investing in smaller companies within its sector that are about to be acquired.

Kukar states that he cannot confirm whether the fund is following this "small company" strategy based on the existing data. He further states that with aggregate industry sector data supplied by

the EATR7 fund, he could determine whether this strategy is being used.

After receiving the assignment and discussing it with Andrews, Kukar discusses some benchmarking issues with a fellow analyst, Rob Kinney. Kukar states: "I want to calculate a return based on a given manager's style of investing. I intend to find an appropriate benchmark portfolio that is not a market index and subtract the benchmark portfolio return from the manager's portfolio return."

Kinney replies: "I believe your calculation will capture the manager's active return and not a style return."

Kinney continues: "To capture the style return, you will need to subtract a market index return instead of a benchmark portfolio return from the manager's portfolio return."

Andrews assigns Kinney to perform a micro attribution analysis for a current fund manager within the DF family of funds. This manager invests in four specific sectors of the US economy and holds some cash, as shown in Exhibit 3.

Exhibit 3				
Micro Attribution Data for DF Fund Manager				
Sector:	Portfolio Weight (%)	Benchmark Portfolio Weight (%)	Portfolio Return (%)	Benchmark Portfolio Return (%)
1	20	30	-0.4	-0.7
2	40	30	3.8	4.2
3	10	20	2.4	2.6
4	25	20	5.4	2.92
Cash:	5	0	0.09	0

Note: DF fund manager has trading costs of 27 basis points.

1. The primary reason for the TWR differing from the MWR for the BITR3 fund is most likely:
 - A withdrawal prior to the fund value rising.
 - Withdrawals being larger in magnitude than contributions.
 - A contribution prior to the fund value rising.
2. The incremental return contribution of the total fund for the EATR7 fund is closest to:
 - 13.9%.
 - 14.9%.
 - 15.1%.
3. When Kukar discusses the data in Exhibit 2 with Andrews, his statement with regard to analyzing the "small company" strategy is most likely:

- A. Correct in regard to the existing data and the additional data requirements.
 - B. Incorrect in regard to the existing data.
 - C. Incorrect in regard to the additional data requirements.
4. In the conversation between Kukar and Kinney about benchmarking, which statement is most accurate?
- A. Kinney's statement about the style of investing
 - B. Kukar's statement about the style of investing
 - C. Kinney's statement about active return
5. The total value added return by the DF fund manager is closest to:
- A. 0.6%.
 - B. 2.8%.
 - C. 0.9%.

Case 5: Kim Simpson and Janet Long Scenario

Kim Simpson, CFA, manages a \$75 million multi-cap growth portfolio. Simpson follows a growth investment strategy and her investment universe consists of small, medium, and large capitalization stocks. She turns the entire portfolio over once each year. Simpson is concerned about the amount of trading costs she has generated through the implementation of her investment strategy and decides to conduct a trade cost analysis with the cooperation of her trader, Janet Long, CFA.

Simpson and Long review a trade in Nano Corporation, a small biotechnology company. To capture both explicit and implicit trading costs, Simpson measures execution costs using implementation shortfall. The buy order of Nano Corporation has the following details:

- Simpson decided to buy 100,000 shares of Nano Corp. at 9:00 am when the stock price was \$35.00 per share. She sets a price limit of \$35.50 per share.
- Long did not release the order to the market until 9:40 am when the share price was \$35.15.
- By the end of the trading day, 90,000 shares of the order had been purchased at an average price of \$35.41, and the share price closed at \$35.65 per share.
- The commission paid was \$0.02 per share.
- The beta of Nano Corp is equal to 1.

Long suggests to Simpson that a market-adjusted cost should be used to assess trading cost. She notes that VWAP for a relevant stock index over the trade horizon is lower than the index arrival price for the trade.

Long suggests reviewing the trade policy document of the firm. She makes the following suggestions to improve the trade governance of the firm:

- Restrict the list of eligible brokers to only those who transact at the lowest trading costs in order to ensure best execution is being attained.
- Restrict the list of execution venues disclosed in the document to only lit exchanges so it does not compromise anonymity when trading on dark pool trading venues.
- Include a trade aggregation and allocation policy for trades executed across multiple accounts.

1. The total implementation shortfall for the trade in Nano Corporation is closest to:

- A. -\$45,200.
- B. \$43,400.
- C. \$45,200.

2. The arrival cost for the trade in Nano Corporation is closest to:

- A. 50 bps.

- B. 74 bps.
 - C. 117 bps.
3. The market-adjusted cost for the Nano Corporation trade, relative to the arrival cost, is most likely to be:
- A. lower.
 - B. higher.
 - C. the same.
4. Which of the suggestions by Lang would most likely improve the trade governance of the firm?
- A. Restricting the list of eligible brokers.
 - B. Restricting the list of execution venues.
 - C. Including a trade aggregation and allocation policy.

Case 6: Education Investment Foundation Scenario

The investment committee (IC) of the Education Investment Foundation (EIF) has recently approved a change in the fund's IPS to increase its allocation to alternative investments.

The investment staff have drafted manager selection procedures for assessing potential external alternative investment managers. An excerpt from the policy is displayed below in Figure 1.

Figure 1: Excerpt from Manager Selection Policy

The investment committee is aware that the costs to the fund of hiring and firing decisions are significant, and that policy should ensure as much as possible that mistakes are minimized. A central part of the manager selection policy is a proprietary database with two key purposes:

- Purpose 1: record the subsequent performance of managers that met initial screening criteria and were interviewed by investment staff, but not allocated to by the fund.
- Purpose 2: record the subsequent performance of managers that were removed from the fund due to sub-optimal performance.

The IC is keen to monitor external alternative investment fund managers for style drift. They are contemplating whether to use returns-based style analysis (RBSA) or holdings-based style analysis (HBSA). The IC lists the following considerations when choosing which style analysis method to use:

- Due to the private nature of most alternative investment structures, the method should not use data that is potentially difficult to get
- The method should mitigate the effect of window dressing by the manager

The IC is also concerned about the higher fee structures that are seen in alternative fund structures versus traditional fund structures. They ask the investment staff to summarize the different types of fee schedules employed by managers. This summary is displayed in Figure 2.

Figure 2: Fee Schedules

Fee	Base	Profit-Share	Computation
Schedule	Fee		
1	0.50%	30%	higher of base or base + share of active return. maximum fee = 3%
2	0.75%	20%	higher of base or base + share of performance net of base
3	1.00%	10%	base + share of performance net of base

The IC requests that the investment staff apply the fee schedule to a year where the gross return of the fund is +10% while the benchmark returns 5%, and secondly where the gross return of the fund is -10% while the benchmark returns -5%.

1. With regard to the manager selection policy purposes described in Figure 1, which of these is correct?
 - A. Both Purpose 1 and 2 are designed to minimize Type I errors.
 - B. Both Purpose 1 and 2 are designed to minimize Type II errors.
 - C. Purpose 1 is designed to minimize Type I errors, Purpose 2 is designed to minimize Type II errors.
2. Based on the IC's considerations regarding style analysis, the most appropriate method to use is:
 - A. returns-based style analysis.
 - B. holding-based style analysis.
 - C. both methods of analysis because both are equally appropriate.
3. Which of the fee schedules listed in Figure 2 would give rise to the highest investment management fees given a gross performance of +10% and a benchmark return of 5%?
 - A. Schedule 1.
 - B. Schedule 2.
 - C. Schedule 3.
4. Which of the fee schedules listed in Figure 2 would give rise to the lowest or most negative investment management fees given a gross performance of -10% and a benchmark return of -5%?
 - A. Schedule 1.
 - B. Schedule 2.
 - C. Schedule 3.

Case 7: Cameron Li and Rick Gleeson Scenario

Somerset Investment Limited is a Singapore-based money management firm that is conducting an appraisal of its investment performance. Cameron Li, CFA, has been charged with conducting the appraisal and is to report back to upper management with his findings.

Li is convinced that trade executions play a substantial role in overall portfolio performance, particularly for funds that have a relatively high level of turnover during the year. As a result, he is seeking methods that will allow him to evaluate the quality of trade executions.

He first consults the firm's head trader, Rick Gleeson, about the relationship between trade urgency, market impact and execution risk. Gleeson makes the following two statements.

Statement 1: Market impact increases when large orders are traded with higher urgency.

Statement 2: Trading with lower urgency is associated with lower execution risk.

Li asks Gleeson for some recent trade data that he can use for analysis and presentation to management. He receives the following data relating to a series of buy trades for Sumatra Natural Resources (SNR), with all currency values in Singapore dollars:

Trades of Sumatra Natural Resources		
Time	Execution Price	Shares Bought
10:30	\$22.33	900
11:15	\$22.43	600
13:45	\$22.47	700
15:00	\$22.65	800

Gleeson also tells Li that the portfolio manager had originally made the decision to purchase 5,000 SNR shares at 10:00 am when the price was \$22.26. Gleeson released the order to the market at 10:20 am when the price was \$22.29. The closing price for the day was Gleeson's last trade at \$22.65, at which point the order for the remaining 2,000 shares was cancelled. Gleeson executed the trade at an average price of \$22.47 and total commissions paid amounted to \$210. Gleeson subsequently provides Li with a summary of the algorithmic trading strategies that he has used in the last month. Li notes that a significant number of Gleeson's algorithmic trades have been executed using arrival price algorithms.

1. How many of Gleeson's statements regarding trade urgency are correct?
 - A. None.
 - B. One.
 - C. Two.

2. The trading cost for purchasing 3,000 SNR shares is closest to:
 - A. \$210.

- B. \$534.
 - C. \$624.
3. The arrival cost for purchasing 3,000 SNR shares is closest to:
- A. 63 bp.
 - B. 72 bp.
 - C. 81 bp.
4. The trades executed by arrival price algorithms are most likely to:
- A. require high urgency.
 - B. be relatively large orders.
 - C. be in relatively illiquid securities.

Solutions

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If you have people you love, allow them to be free beings.

Give and don't expect. Advise, but don't order. Ask, but never demand. It might sound simple, but it is a lesson that may take a lifetime to truly practice. It is the secret to true Love. To truly practice it, you must sincerely feel no expectations from those who you love, and yet an unconditional caring.

如果你有爱的人，允许他们自由随意的存在。给予而不指望；建议而不命令；请求而不要求；可能听起来简单，但这需要一辈子去实践。这就是真爱的秘诀。真正去实践它，你必须对那些你爱的人没有期望，并给予无条件的关爱。



2020 年 12 月 CFA 三级百题预测（下）

1. SS3 BEHAVIORAL FINANCE
2. SS12-13 PRIVATE WEALTH MANAGEMENT
3. SS5 ASSET ALLOCATION
4. SS11 ALTERNATIVES
5. SS15 TRADING, PERFORMANCE EVALUATION, AND MANAGER SELECTION

今年由于疫情的缘故，CFA 考试被迫延期。虽然给了大家更多的复习时间，但也不可掉以轻心。近年来，CFA 考试的难度在逐步提高，并且在三级中更偏向实务与理论结合的考察。相比 2019 年考纲，2020 年考纲发生了较多的变化。其中关于经济学的部分，更名为资本市场预期，并进行了重大改变；衍生产品与资产配置中的外汇管理合并在一起，并进行了较大的改写；另类投资的内容完全重新改写；交易与业绩评估合并在一起，并重新编写。而一向是考试重点的私人财富管理和机构组合管理也发生了较大变化，其中私人财富管理的第一个 Reading 重新编写，而机构组合管理也进行了重新编写，这些变化需引起考生重视。百题中的题目，紧密贴合考纲和考试难度，所有题目均来自于网络公共平台和学员分享。为了全面应对考试，我们全面推出了的各种学习平台，如金程网校、手机 APP、金程 CFA 答疑等活动，请各位充分利用。如有学术问题，请登录至金程网校提问。祝大家好运，顺利通过 CFA 三级考试，加油！

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6. SS3 Behavioral Finance

Case 1: Green

1. Solution: A.

A is correct. Statement 3 is incorrect, traditional finance assumes investors have access to perfect information and process all available information in an unbiased way. Green has commented they process all available information based on their own experiences. Statement 1 regarding prices and Statement 2 regarding information are both correct.

2. Solution: A.

A is correct. Weaver's criticisms concerning the rational economic man (REM) are correct. A common shortcoming of the theory concerns the inner conflicts that real people face and even Keynes acknowledged the limitations of people in making decisions.

3. Solution: C.

C is correct. Behavioral biases can be categorized as either cognitive errors or emotional biases. Cognitive errors stem from basic statistical, information-processing, or memory errors and are considered to result from faulty thinking. Weaver's elderly client has exhibited a cognitive error: an information-processing or memory error regarding the losses that were taken to eliminate taxable realized gains which resulted in a higher than normal cash balance.

4. Solution: A.

A is correct. Weaver's client most likely demonstrated satisficing when he purchased the antique vehicle. Satisficing combines satisfy and suffice and describes decision, actions, and outcomes that may not be optimal, but are adequate.

5. Solution: B.

B is correct. Conclusion 3 is least likely correct. Green and Weaver's conclusion regarding sophisticated investors being better positioned to outperform less savvy participants in efficient markets is incorrect. Only in inefficient markets may sophisticated investors have an advantage. In theory if markets are strong form efficient neither investor would have an advantage. Both Conclusion 1 regarding support for both efficient markets and anomalous markets and Conclusion 2 regarding the construction of investment are both correct.

Case 2: Philly

1. Solution: A.

A is correct. Bailey is not exhibiting characteristics of multiple investor types. He is only exhibiting the investor characteristics associated with an Active Accumulator (AA) that include both cognitive and emotional biases. His is also exhibiting behavioral changes as he is aging as he has become more emotional about his investment portfolio.

2. Solution: A.

A is correct. Owen's comment regarding Steven's current portfolio construction is not correct. Her current portfolio is subject to mental accounting, has been constructed in layers and does not take into consideration covariance between assets.

3. Solution: C.

C is correct. Burke's comment that he had suffered a major loss in LTop stock in the past and because of that experience he would not be able to support buying the stock regardless of the improved outlook and analyst upgrade unduly influenced the other committee members. The committee member's actions demonstrated Social Proof, they wrongly endorsed the Investment Committee Chair's judgement and they may not have been fully aware they were doing so.

4. Solution: B.

B is correct. Philly's increased trading activity is indicative of overconfidence. In bubbles investors often exhibit symptoms of overconfidence; overtrading, under-estimation of risks, failure to diversify, and rejection of contradictory information. With overconfidence, investors are more active and trading volume increases, thus lowering their expected profits. Overconfidence and excessive trading are linked to confirmation bias and self-attribution bias as well as hindsight bias and the illusion of knowledge.

Case 3: Emerald

1. Solution: A.

Both Conner and Donnelly are exhibiting emotional biases. When advising emotionally biased investors, advisers should focus on explaining how the investment program being created affects such issues as financial security, retirement, or future generations rather than focusing on quantitative details. The recommendation for Conner would be more suited for a cognitively biased investor. O'Driscoll is a cognitively biased investor (friendly follower). As such, focusing on such metrics as the Sharpe Ratio would be appropriate for this client.

2. Solution: B.

Donnelly is entrepreneurial and created his own wealth. He lacks spending controls, does not believe in the benefits of portfolio diversification, has a high risk tolerance, and prefers high-risk investments recommended by friends. These are all attributes of an active accumulator.

3. Solution: A.

The illusion of control bias can be encouraged by complex models. The illusion of control can lead to analysts being overly confident when forecasting complex patterns, such as future interest rate movements.

4. Solution: A.

Framing bias is a type of cognitive error in which a person answers a question differently based on the way in which it is asked. This behavior is unlikely to explain the persistence of momentum. Regret is a type of hindsight bias that can result in investors purchasing securities after a significant run-up in price because of a fear of not participating. This bias could explain momentum. With availability bias, also referred to as the recency effect, the tendency to recall recent events more vividly can result in investors extrapolating recent price gains into the future. This bias could also explain momentum.

5. Solution: B.

It is recommended that investment committees be composed of people with differing skills and experiences, not similar as Kelly has suggested. Decision makers are most likely to learn to control harmful behavioral biases when they have repeated attempts at decision making and there is good quality feedback on prior outcomes. The investment committee chair should actively encourage alternative opinions so that all perspectives are covered. Asking for individual views prior to discussion can help mitigate the impact of group thinking.

Case 4: Krista Duchene

1. Solution: B.

Jonathan has relatively low wealth and high standard of living risk (SLR), suggesting we mitigate (change his behavior). But he is also emotional and we will likely have to accommodate some of his biases. The desire to hold the investment grade bonds his father bought is an emotional (endowment) bias, but it makes sense that he retains significant fixed income, given his lower overall risk tolerance and the fact that he is approaching retirement. We can more reasonably accommodate that bias and retain the bonds. Totally avoiding international equity ignores the potential to lower his portfolio risk through diversification as well as potentially improve his return. Both are important given his significant SLR. It makes more sense to work with him and mitigate that bias.

2. Solution: C.

The loss that has already occurred, cannot be changed, and should not rationally affect his next decision. The proposal has an expected payoff of losing \$50 (50% chance of making \$5,000 and 50% chance of losing \$5,100) but the payoff is clearly uncertain. A risk averse investor would not accept the proposal.

A risk averse investor would not even accept a fair wager with an expected 0 payoff. Accepting a negative payoff event is risk seeking. Seth is so averse to emotionally accepting he has already lost 5,000, he will take a proposal with a negative payoff.

3. Solution: C.

Leah's description of the coin toss is an example of gambler's fallacy; in this case a mistaken belief that reversal to the mean dictates that the previous coin flips affect the next outcome. With a coin, the next and every flip is independent of all other flips and a 50/50 proposition. Anchoring and adjustment refers to being "anchored" to a previous data point. Being influenced by (anchored to) the previous forecast, the individual is not able to fully incorporate or make an appropriate adjustment in her forecast to fully incorporate the effect of new information. It is not the same as inaccurately extrapolating past data into the future. Confirmation bias refers to the tendency to view new information as confirmation of an original forecast.

4. Solution: A.

Micah is clearly anchored to the original purchase price of 25, so the behavior is most like anchoring and adjustment. There are also elements of conservatism, forming an initial rational view and then not updating it; as well as confirmation, ignoring new analyst reports that the current price is fair. However, Micah's situation is more specific in that he is "anchored" to his \$25

initial purchase price.

5. Solution: C.

Status quo bias, endowment bias, and regret aversion bias are very closely related. However, status quo is maintaining a choice out of inertia, which is exactly what Stacey is doing.

In contrast, endowment bias arises when some intangible emotional value is assigned to a holding, perhaps because it was inherited. That may well be true, but the facts do not specifically tell us that. Regret aversion bias is the fear of making a change and having it go badly, so the thought is that by doing nothing, one will never be responsible.

6. Solution: A.

The behavioral asset pricing model adds a sentiment premium to the discount rate of the traditional capital asset pricing model; the required return on an asset is the risk-free rate, plus a fundamental risk premium, plus a sentiment premium. There is nothing in the behavioral asset pricing model that mentions satisficing.

The adaptive markets hypothesis (AMH) assumes successful market participants apply heuristics until they no longer work and then adjust them accordingly. In other words, success in the market is an evolutionary process. Those who do not or cannot adapt do not survive. AMH specifically assumes that investors satisfice rather than maximize utility.

Holding a well-diversified portfolio as prescribed by traditional finance will maximize utility in theory. With behavioral portfolio theory, individuals construct a portfolio by layers. Each layer reflects a different expected return and risk. The end result does not maximize utility in theory, so there is an element of satisficing occurring. Satisfice is described as investors gathering what they consider to be an adequate amount of information and apply heuristics to arrive at an acceptable decision (i.e., behavioral portfolio theory). The investor does not necessarily make the theoretically optimal decision from a traditional finance perspective.

Case 5: Arzac Wealth Management Services

1. Solution: C.

Arzac's ideal clients would most likely be classified as the Guardian investor personality type using the BB&K classifications. Guardians are cautious and concerned about the future, particularly as they approach retirement. They are concerned about protecting their assets and may seek advice from those they perceive as being more knowledgeable than themselves.

B is incorrect because Individualists are independent and confident investors who like to make their own decisions. They are unlikely to easily take advice without doing their own analysis.

A is incorrect because celebrities hold opinions about some things but may be willing to take advice about investing. They only recognize their investment limitations to a certain extent.

2. Solution: B.

B is correct. Because risk analysis is a cognitive process, the risk tolerance questionnaire may fail investors with an emotional bias—those who are likely to view risk as an emotional process rather than a cognitive process. Risk tolerance questionnaires will likely work better for investors with a cognitive bias because they are likely to think about risk more logically. Therefore, Arzac's questionnaire will likely fail Active Aggressive investor types because of their primary emotional bias. Consequently, the relationship between the investor and the adviser may not be favorable.

A is incorrect because an Active Growth investor type has a primary cognitive bias. Investors with a cognitive bias look at risk as a cognitive process, not an emotional process.

C is incorrect because a Passive Moderate investor type has a primary cognitive bias. Investors with a cognitive bias look at risk as a cognitive process, not an emotional process.

3. Solution: A.

Pak constructed his initial investment portfolio through the equal distribution of mutual funds, reflecting simple heuristics or a framing bias. This is an example of a naive diversification strategy (i.e., dividing assets equally among available funds irrespective of the underlying composition of the funds). The equal distribution may also reflect a fear of regret: Pak doesn't understand which fund will outperform, so he decides to invest in all three equally.

B is incorrect because Pak has been increasing his exposure to global securities over time, as he wants to reduce risk by increasing his diversification by investing outside his home market. He does not have a home bias.

C is incorrect because Pak did not purchase an investment on the basis of familiarity but declined to purchase his employer's stock because he felt the company was not performing to expectations.

4. Solution: B.

In expressing the opinion that he should have known the Brexit referendum outcome in advance, Pak is exhibiting hindsight bias or regret. Humans have a tendency to see past events as having been predictable, and the resulting regret can be acute when the event results in a highly volatile market.

A is incorrect because Pak did not follow his friends when they exited the market prior to the Brexit referendum.

C is incorrect because Pak is selling his biggest losers so does not exhibit signs of loss aversion.

5. Solution: A.

Self-attribution bias is a bias in which people take personal credit for successes and attribute failures to external factors outside the individual's control. There is no evidence she takes personal credit for her success. Torok actually credits the firm's financial models for the accuracy of the forecasts.

B is incorrect because Torok is likely overconfident given that she considers herself to be one of the top five analysts in the market and being asked to speak at banking conferences and on TV. She also sources additional information similar in nature, so it is unlikely to increase the accuracy of her forecast but instead reinforces her confidence in that forecast.

C is incorrect because Torok may have been subject to the illusion of control due to using highly complex forecast models. Excess of information cannot eliminate the risk in a model or the modeling process.

6. Solution: C.

The analyst who presents at the committee appears to be influenced by the status and prior comments made by the members of the investment committee. He may have wrongly favored the judgment or endorsement of committee members, which is an example of social proof bias.

A is incorrect. Given that the committee chair insists each analyst presents and gives their opinions before committee members indicates he will unlikely dictate the investment decisions.

B is incorrect because the chair requires all presentations to be made available to the committee well in advance of any meeting. Allowing the committee members to form opinions independently prior to the meeting will likely give rise to active discussions with varying viewpoints. Having members of an investment committee with diverse backgrounds and different investment styles can be viewed favorably in that it can help prevent groupthink. It does not necessarily indicate they will not be able to reach a consensus.

7. SS12-13 Private Wealth Management

Case 1: Boylan

1. Solution: C.

C is correct: Comment 3 is correct. The most relevant considerations in pricing life insurance are mortality expectations, the discount rate and loading. The discount rate represents an assumption about the insurer's return on its investment portfolio and it is used to discount future expected outflows, i.e., death benefits: as the discount rate decreases, the present value of those expected future cash flows increase making insurance costlier, i.e., higher premiums.

2. Solution: B.

B is correct: Human capital is the net present value of the individual's future expected labor income weighted by the probability of surviving to each future age. According to the financial publication, Henry is in the highest paying medical profession, and being the youngest has the longest expected stream of future income. Therefore, he is most likely to have the highest human capital available, and the most to lose if the stream is not realized.

3. Solution: A.

A is correct. In addition to the assets determined under a traditional balance sheet provided in Exhibit 1, a holistic (economic) balance sheet includes the present value of human capital and the value of any pensions.

Current wage	\$430,000
Discount rate:	9% as follows:
risk free rate:	3%
wage growth rate:	5%
occupational income volatility	1%
Total discount rate	9%

Determination of probability weighted present value of Marie's future wages

Age	Probability of dying	Probability of surviving (1 – Prob. of dying)	End of year wage	PV of wages @ 9%	Probability weighted PV of wages
Current	62	0.0059	0.9941	451,500	414,220
	63	0.0069	0.9931	474,075	399,019
Retires	64	0.0079			
				Total	808,042
Sample calculation: at age 62:					
end of year wage:			PV of end of year wage:		

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$$430,000 \times 1.05 = 451,500$$

$$451,500 \div 1.09 = 414,220$$

Total Assets under Holistic Balance Sheet	
Traditional assets (Exhibit 1)	\$4,000,000
Total human capital (from previous table)	808,042
Current pension value (Exhibit 2)	1,750,000
Total assets	\$6,558,042

4. Solution: A.

Step	Item	Calculation	Value
1	FV of premiums: annuity in advance	$\$2,750 \times FVA^{ADV}(25y, 6\%)$	\$159,930
2	FV of dividends: annuity in arrears	$\$850 \times FVA(25y, 6\%)$	46,635
	Time Value adjusted net payment		113,295
3	Estimated cash value (at end of 25 years)		60,000
4	25 year Cost of insurance		\$53,295
5	Annual payment to equal cost of insurance	$\$53,295 \div FVA^{ADV}(25y, 6\%)$	\$916
6	Cost per \$1,000 coverage per year	$\$916 \div (\$300,000 \div \$1,000)$	\$3.05

5. Solution: C.

C is correct: Janice is a stock broker specializing in medical technology and her human capital is therefore highly correlated with stock market returns. She should balance this risk by having greater exposure to financial assets that are less risky, i.e., high grade government bonds. Jason's human capital is less correlated to stock market returns; in addition, his future pension income arising from a defined benefit plan is quite stable. His optimal portfolio should have a greater allocation to the stock market than Janice.

6. Solution: B.

B is correct: Statement 1 is incorrect: since they are both the same age, Jason will receive a higher income yield than his sister as females have a longer average life expectancy than males and therefore a longer expected payout period.

Case 2: Cooper Reyder

1. Solution: C.

The statement regarding term life insurance is most accurate. Life insurance is a perfect hedge against the loss of human capital in the event of death, whereas annuities address longevity risk. Although overall risk tolerance increases with human capital, overall risk tolerance decreases with greater wage risk. The magnitude of loss of human capital at younger ages is much more important than the higher probability of death at older ages.

2. Solution: C.

The family is still exposed to financial market risk because the constant real return assumption with systematic withdrawals may underestimate the effect of short-term market fluctuations early in retirement and cause the family to eventually run out of money.

3. Solution: C.

A jointly owned variable payout lifetime annuity product would provide cash flows until the end of the surviving spouse's lifetime. Therefore, the Jones family will not outlive the assets. It is true there is less certainty regarding the cash flows because they are linked to the performance of the underlying investments.

4. Solution: A.

The statement about the claims by creditors is inaccurate because the trust assets cannot be reached by the beneficiary's creditors. The other statements are accurate.

Case 3: Buylak

1. Solution: C.

The trust was irrevocable, so neither Bryn (while alive) nor his wife would have a claim on any of its assets, including the life insurance policy or its proceeds. Had Paolo predeceased Bryn, the proceeds of the life insurance policy would have been paid to the remainderman on Bryn's death: the University of Izlandia.

2. Solution: A.

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. Only the Izlandia distribution center changes ownership through a provision of the will. Joint ownership with the right of survivorship automatically transfers to the surviving joint owner (Kasey). Death benefit proceeds under a life insurance contract pass directly to policy beneficiaries outside the probate process.

3. Solution: A.

In each year, the tax rate under the deduction method will be:

$$T_{\text{Residence}} + T_{\text{source}} (1 - T_{\text{Residence}})$$

In this case, the tax rate is calculated as follows:

$$(0.25) + 0.35(1 - 0.25) = 0.5125$$

This value is the combined tax rate net of tax relief via the deduction method.

Kasey's after-tax annual cash flow is $\text{€}450,000 \times (1 - 0.5125) = \text{€}219,375$.

4. Solution: A.

After applying 30% appreciation, the 1.5% per year wealth tax, and the two capital gains taxes (local source Landlochen and residential Weshvia using the credit method to calculate), the net proceeds are €3,432,500 calculated as follows:

Sale price	€3,000,000 x 1.30	€ 3,900,000
Minus total taxes (calculated below)		-467,500
Net Proceeds		€ 3,432,500
Calculation of total taxes		
Wealth tax	2,900,000 x 0.015 x 5 years	€ 217,500
Plus capital gains tax from Landlochen	(3,900,000 - 2,900,000) x 0.20	200,000
Plus capital gains tax from Weshvia of 0.25 minus 0.20 credit	(3,900,000 - 2,900,000) x 0.05	50,000
Total taxes		€ 467,500

The two-step calculation of capital gains tax under the credit method is equivalent to:

$$T_{\text{Credit Method}} = \text{MAX}[T_{\text{Source}}, T_{\text{Residence}}]$$

$$=\text{Max}[20\%, 25\%] = 25\%, \text{ giving a capital gains tax of } (3,900,000 - 2,900,000) \times 0.25 = €250,000$$

5. Solution: A.

Calculate the ending value after taxes at the end of 12 years.

$$\text{Accrual equivalent annual return \%} = 100\% \times [(\text{Ending value}/\text{Beginning value})^{1/12} - 1]$$

	Beginning Value (BV)	Return	Formula	Ending Value(EV)
Taxable	€ 1,200,000			
	Returns taxed annually at 28%	0.12	$BV[1 + 0.12(1 - 0.28)]^{12}$	€ 3,243,832
Tax deferred	€ 700,000	0.075	$BV(1 + 0.075)^{12} \times (1 - 0.40)$ = €1,667,245 ×(1 - 0.40)	€ 1,000,347
	Net of 40% distribution tax			
Tax exempt	€ 180,000	0.11	$BV(1 + 0.11)^{12}$	€ 629,721
	Combined ending value			€ 4,873,900
	Combined beginning value			€ 2,080,000
Accrual equivalent after-tax annual return =		$(4,873,900/2,080,000)^{1/12} - 1 = 0.0735 = 7.35\%$		

Case 4: Richards

1. Solution: B.

Primary capital is the sum of assets that fall into the personal and market risk buckets. It includes the residence, municipal bond portfolio, global equity fund and cash equivalents. It excludes the values of MTL and the concentrated positions in CTAS public stock and the warehouse (investment real estate) – those are considered aspirational.

Asset	Value (\$000's)	Cost (\$000's)	Gain= Value - Cost (\$000's)	Tax = Gain x 0.20 (\$000's)	Net Value after tax (\$000's)
Residence	2,000	2,000	0	0	2,000
Muni Bonds	3,000	3,150	(150)	-30	3,030
Global Equities	3,400	1,650	1750	350	3,050
Cash Equivalents	300	300	0	0	300
			Total Net Value =		8,380

2. Solution: C.

Richards's understanding about avoiding immediate capital gains is correct. The short sale against the box approach defers capital gains. No sale of stock occurs in establishing the collar. The short against the box strategy is riskless, whereas the collar does carry risk within the range between the exercise prices of the put and the call. The dividends will continue to be paid to Richards only in the collar. The dividends will pass through to the lender of the shares that were borrowed in the short against the box strategy and are thus not available to Richards.

3. Solution: A.

Adams's statement about the short sale against the box is correct because it creates a riskless position. Although the forward conversion with options avoids counterparty risk, the equity forward sale and the total return equity swap use a derivatives dealer and thus include counterparty risk.

4. Solution: A.

Immediate cash inflows available would include proceeds and the possible first rental payment in Offer 2; all cash flows are net of taxes. As shown in the table below Offer 1, selling the warehouse outright, produces the highest immediate cash flow net of taxes (Income Tax rate = 40%):

Offer	Offer Amount	Cost	Taxes Paid Gains Taxes = 20%	Loan Proceeds LTV = 80%	Initial Lease Payment	Income tax deduction	Net To Reinvest Offer less all

						on rent	taxes
1	4,800,000	4,300,000	(100,000)				4,700,000
2	5,800,000	4,300,000	0 as no sale occurs	4,640,000			4,640,000
3	4,900,000	4,300,000	(120,000)		(150,000)	60,000	4,690,000

5. Solution: C.

MTL Strategy 2 is not a staged exit strategy because it does not provide for two specific liquidity events: cash up front and a sale or monetization of the remainder of Richards's ownership in the future. Strategies 1 and 3 are staged exit strategies that provide for two liquidity events.

6. Solution: B.

Evidence of both cross hedging and a mismatch in character is present in MTL Strategy 2. Buying put options on the ETF is a cross hedge against the industry risk faced by the public company. The scenario outlines an exercise of employee stock options, which will be taxed as ordinary income, and an eventual profit from a put option which will be taxed as a capital gain. This difference in tax type is a mismatch in character.

Case 5: James Hatfield Scenario

1. Solution: A.

This is a trivial question, but the reading does point out that flat heavy tax regimes often include provisions for tax exemption of some types of bond interest.

2. Solution: C.

The case information suggests her level of income will change, but because she is subject to a flat tax, her tax rate will be constant regardless of her level of income. When current and future tax rates are equal, TDA and TEA produce the same net ending value.

3. Solution: B.

The most recently acquired shares will have the highest basis and the lowest tax consequences.

4. Solution: C.

There must be a weight for the allocation of each asset to each type of account.

Case 6: Rhys Jacobs

1. Solution: A.

A is correct. The strategy to hold assets for the long term and avoid paying capital gains until the assets are sold many years later is an example of a tax deferral strategy.

B is incorrect. Strategy 2 is a tax avoidance strategy because no taxes are paid on tax exempt securities.

C is incorrect. Strategy 3 is a tax reduction strategy because the tax rate on the capital gains is lower than the income tax rate.

2. Solution: A.

Note 3 is most accurate. Monte Carlo simulation provides a probability distribution of outcomes, not simply a yes/no answer. In this context, the discussion of the investment strategy with a likelihood of achieving a certain return is an accurate description of the results of a Monte Carlo simulation. Merely using long-term averages for capital market returns or inflation assumptions oversimplifies their variability and leads to the clearly unrealistic implication of linear wealth accumulation.

B is incorrect because getting to a yes/no decision is also oversimplified and representative of a deterministic approach, which is opposite to the Monte Carlo process that emphasizes probability distributions.

C is incorrect because this description simply uses long-term market returns and averages. It is too simplified and suggests a linear approach to personal retirement planning and does not convey the notation of variance (or likelihood) of the value.

3. Solution: A.

A is correct.

Accumulated Value	Calculation	Results
Ignoring taxes	$\$250,000 \times [1 + 0.08]^{25}$	\$1,712,119
Including taxes	$\$250,000 \times [1 + 0.08 \times (1 - 0.10)]^{25}$	1,421,706
Amount consumed by taxes		\$290,413
Investment gain	$\$1,712,119 - \$250,000$	\$1,462,119
Investment gain consumed by taxes	$\$290,413 / \$1,462,119$	19.90%

C is incorrect because it taxes the gain at the end.

Accumulated Value	Calculation	Results
Ignoring taxes	$\$250,000 \times [1 + 0.08]^{25}$	\$1,712,119
Investment gain	$\$1,712,119 - \$250,000$	\$1,462,119
Tax on gain	$10\% \times 1,462,119$	\$146,212

Investment gain consumed by taxes	\$146,212/\$1,462,119	10.00%
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B is incorrect because the wrong denominator was chosen when calculating the percent gain:
 $\$290,413/\$1,712,119 = 17.0\%$.

4. Solution: A.

If Jacobs wants to be 94% certain that his portfolio will last, he can tolerate a 6% failure rate. A spending rate of \$4 per \$100 of assets has a ruin probability of 6.3%, which is close to the stated failure rate of 6% (Exhibit 2). Therefore, he can withdraw just under 4% from the balanced portfolio, or $0.04 \times \$2,000,000 = \$80,000$.

B is incorrect because it incorrectly equates \$6 per \$100 of assets with the 6% failure rate. In this case, the calculation is $0.06\% \times \$2,000,000 = \$120,000$.

C is incorrect because it incorrectly assumes the hazard rate of 4.75% is the failure rate. In this case, the calculation is $4.75\% \times \$2,000,000 = \$95,000$.

5. Solution:C.

Premiums paid by the policyholder are not considered part of the policyholder's estate at the time of death.

A is incorrect because death benefits are tax exempt in most jurisdictions.

B is incorrect because combining life insurance and trust management can be a powerful retirement planning strategy.

6. Solution:C.

$$\begin{aligned} T_{\text{Deduction Method}} &= T_{\text{Source}} + (1 - T_{\text{Source}}) \times T_{\text{Residence}} \\ &= 10.0\% + 15.5\% - (10.0\% \times 15.5\%) = 24.0\% \end{aligned}$$

A is incorrect because it assumes the exemption method, but from the perspective of Sahjong, not Mahjong, where the residence country (Sahjong) imposes no tax on foreign-sourced income.

B is incorrect because the tax rate would 15.5% under the exemption method (income from Mahjong would be taxed at the source rate, or Mahjong's tax rate): $T_{\text{Exemption Method}} = T_{\text{Source}}$.

Case 7: Connor McClelland

1. Solution: B.

The Grahams' net wealth is their total assets less their total liabilities ($\$7,512 - \$5,098 = \$2,414$), as calculated in the following economic balance sheet.

Assets		Liabilities	
Financial Capital		Debts	
Checking account	27	Residential mortgage	\$285
Taxable investment account	625	Home equity line of credit-outstanding balance	38
Residence	525		
Cash value of life insurance (combined Bradley and Reagan)	119	University education for children	350
Human capital (combined Bradley and Reagan)	3,940	Vacation home	325
Employer pensions (combined Bradley and Reagan)	956	Lifetime consumption (present value)	3,700
Military pension (Reagan)	1,320	Planned donations	400
Total Assets	\$7,512	Total Liabilities	\$5,098
		Net Wealth	\$2,414
		Total Liabilities and Net Wealth	\$7,512

A is incorrect. Human capital was not included in assets and lifetime consumption was not included in liabilities: $[(7,512 - 3,940) - (5,098 - 3,700)] = 3,572 - 1,398 = 2,174$.

C is incorrect. The death benefit rather than the cash value of life insurance was included in the calculation of assets: $(7,512 + 250 + 250 - 119) - 5,098 = 7,893 - 5,098 = 2,795$.

2. Solution: C.

Personal assets are consumed, whereas investment assets are held for the potential to increase in value and fund future consumption. Some assets, such as real estate, can be described as "mixed assets" because they can act as both personal assets (shelter) and investment assets (to help fund retirement).

B is incorrect. Financial capital includes the tangible and intangible assets (outside of human capital) owned by an individual or household. Financial capital would include the vested portion but not the unvested portion of an employer pension plan.

A is incorrect. The economic wealth of an individual changes throughout their 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.

3. Solution: B.

A risk with the loss characteristics of high frequency of occurrence and low severity of loss, such as dental cavities, is best managed through risk reduction—for example, through proper dental hygiene. A risk with the loss characteristics of low frequency of occurrence and high severity of loss, such as an earthquake that destroys your home, is best managed through risk transfer. A risk with the loss characteristics of low frequency of occurrence and low severity of loss is best managed through risk retention, such as not purchasing an extended warranty on an infrequently used and relatively inexpensive item.

A is incorrect. A risk with the loss characteristics of low frequency of occurrence and low severity of loss would be best managed through risk retention, such as not purchasing an extended warranty on an infrequently used and relatively inexpensive item.

C is incorrect. A risk with the loss characteristics of low frequency of occurrence and high severity of loss, such as an earthquake that destroys your home, would be best managed through risk transfer.

4. Solution: A.

The additional amount of life insurance Bradley should purchase using the human life value method is calculated as follows. The calculations assume (1) Bradley works for exactly 15 years and (2) his family needs the proceeds of the life insurance immediately upon his death.

1) Calculate the pretax income needed to be replaced

Bradley's annual income (before taxes)	\$175,000
Less: income and payroll taxes at 30% ($\$175,000 \times 30\%$) =	52,500
Annual income (after taxes)	122,500
Less: family expenses attributable to Bradley	20,000
Net annual income after expenses attributable to Bradley	102,500
Plus: non-taxable employer contribution to defined-contribution retirement plan $(\$175,000 \times 5\%) =$	8,750
Net after-tax income needed to be replaced for Bradley	111,250
Amount of pretax income needed to replace the net after-tax income: $[(\$111,250/(1 - 0.20))] = (\$111,250/0.80) =$	\$139,063

2) Adjust the discount rate to account for the projected growth rate of earnings and expenses

Discount rate: 4%

Projected annual salary and expense increase for Bradley: 3%

Calculate the adjusted rate (i):

$$\begin{aligned} i &= [(1 + \text{Discount rate})/(1 + \text{Growth rate})] - 1 \\ &= [(1 + 0.04)/(1 + 0.03)] - 1 = (1.04/1.03) - 1 \\ &= 1.0097 - 1 = 0.0097 = 0.97\% \end{aligned}$$

3) Determine the total amount of life insurance needed by calculating the present value of an annuity due in advance

$$\$139,063 \times PVA^{ADV}(15 \text{ years}, 0.97\%) = \$1,951,345$$

4) Less Bradley's current life insurance coverage (from Exhibit 1) (250,000)

5) Additional life insurance required for Bradley \$1,701,345

B is incorrect. The employer contribution to the defined-contribution retirement plan was not included in Step 1 of the calculation.

C is incorrect. The current \$250,000 life insurance coverage was not deducted from the calculation of the total life insurance needed.

5. Solution: C.

Because property is a financial asset, property risk is normally considered to be associated with a potential loss of financial capital, whereas earnings and health risk can affect both financial and human capital. Although the value of the Grahams' residence is significant, it is a minor portion of the family's overall financial and human capital. Thus, property risk is least likely to adversely affect the Grahams' ability to maintain their lifestyle, purchase a vacation home, pay for their children's university education, and fund charitable donations.

A is incorrect. Health risk is the risk and implication associated with illness or injury. Even with insurance, direct financial costs associated with illness or injury may include coinsurance, copayments, and deductibles. Health factors also typically have an impact on life, disability, and long-term care insurance premiums. Health risks also have implications for human capital and financial capital. For example, if a worker becomes disabled, he or she may be unable to work while health expenses are incurred, resulting in a loss to both current assets and future earnings.

B is incorrect. Earnings risk is the risk associated with an individual's earning potential. Given that there are 15/17 years before retirement, this is a significant risk for them. Earnings can be impacted by death, health issues, unemployment, and underemployment. The loss of earnings reduces human capital by reducing the present value of future expected labor income and financial capital because assets will be needed to make up for any loss of income.

6. Solution: A.

A variable joint life annuity is most appropriate. The Grahams have characteristics that are

compatible with variable annuities—average risk tolerance and the ability to adjust their spending in retirement—enabling them to select a variable annuity for which payment is linked to a risky portfolio of assets. The joint life feature will provide payments until both of them are no longer living.

B is incorrect. While the joint life feature would provide payments until both of the Grahams are no longer living, a fixed annuity would lock them into a constant income stream that is guaranteed not to change.

C is incorrect. The life annuity with period certain feature provides payment for the life of the annuitant and is guaranteed for a minimum number of years. If Bradley purchased a variable life annuity with period certain policy with a 10-year guarantee and he died after 6 years, Reagan would receive payments for only 4 more years as the beneficiary. If Bradley died after the guaranteed minimum, say at 12 years, Reagan would not receive any more payments.

8. SS5 Asset Allocation

Case 1: Windsong

1. Solution: B.

B is correct. The economic net worth is the difference between the total assets and the total liabilities ($21.00 - 15.25 = 5.75$), as calculated in the following economic balance sheet.

Economic Balance Sheet of Jane Lennon (in \$ millions)

Assets		Liabilities and Net Worth
Financial Assets		Financial Liabilities
Investment portfolio	8.00	Mortgage: vacation property
Restricted shares	1.00	
Real estate: residence	2.00	Extended Liabilities
Real estate: vacation property	3.00	Everett's education
Defined contribution pension plan	2.50	Trust for Marshall
University endowment		1.75
PV of future consumption		9.00
Extended Assets	Total Liabilities	15.25
Human capital	4.50	Net Worth Economic net worth 5.75
Total Assets	21.00	Total Liabilities 21.00 and Net Worth

A is incorrect. It ignores the restricted shares but keeps everything else: $(21 - 1) - 15.25 = 4.75$

C is incorrect. It ignores earnings until retirement (human capital): $(21 - 4.5) - 15.25 = 1.25$

2. Solution: A.

A is correct. Both of the funds planned for the trust and university endowment represent an imminent need (immediate for the trust and within two years for the endowment). The funding needed for education, however, extends over the longest time horizon, possibly as long as 8 to 10 years. Thus, its sub-portfolio would be in the best position to take on the greatest risk.

B is incorrect. Although the special needs trust for Marshall will provide benefits for his entire life, and therefore has a long-time horizon, from Lennon's perspective it requires immediate funding and should be very liquid and bear little risk.

C is incorrect. Funding of the university endowment involves a short-term time horizon (within two years) so it should bear little risk.

3. Solution: C.

C is correct. The behavioral bias illustrated in Lennon's past investment experience was loss-aversion bias: Losses are perceived as more painful than the satisfaction of equivalent gains, and assets that have incurred losses but have little chance of recovery are retained because the pain of recognizing the loss is too great. Given the risk of having to give back gains already realized, winning investments are often sold early, resulting in self-imposed limited upside potential.

A is incorrect. Self-control bias is a bias in which people fail to act in pursuit of their long-term, overarching goals because of lack of discipline. Lennon does not appear to exhibit this bias because she has taken steps to deal with her specific goals, including saving for her own future and that of her children.

B is incorrect. The mental accounting bias involves setting up separate accounts or buckets for wealth, each with its own risk tolerance and expected return depending on the purpose the investor associates with it. Although one of Fox's comments refers to taking higher risk to achieve one of the goals, this is not being referred to in Exhibit 1, which deals with retaining losers and selling winners.

4. Solution: A.

A is correct. Kelly's second comment regarding institutions' goals-based allocations is correct. Some institutions (e.g., insurance companies) segment their general account assets into sub-portfolios associated with specific lines of business or blocks of liabilities, with each sub-portfolio having its own return objective.

B is incorrect. Trainor is incorrect. Some institutions may focus on asset-only allocations, but another approach that can be used is liability-relative, which focuses on the assets in relation to the liabilities.

C is incorrect. Kelly's first comment about the Sharpe ratio and the law of large numbers is incorrect. Institutions that maximize their Sharpe ratio for an acceptable level of volatility would be following an asset-only asset allocation approach, and, as such, they would not be concerned with modeling their liabilities.

5. Solution: B.

B is correct. Although Trainor is correct that asset classes should be diversifying, low pairwise correlations with other asset classes is not sufficient. An asset class may be highly correlated with some linear combination of the other asset classes even when pairwise correlations are not high. Both of Kelly's comments are correct: Asset classes should have high within-group correlations but low correlations with other classes. If liquidity and transaction costs are unfavorable for an investment of a size meaningful for an investor, an asset class may not be a suitable investment

for that investor.

A is incorrect. Kelly's first comment is correct about both the within-group and between class correlations.

C is incorrect. Kelly's second comment is correct. The criteria that he is referring to is that asset classes should have the capacity to absorb a meaningful proportion of an investor's portfolio. He is correct in saying that if liquidity and transaction costs are unfavorable for an investment of a size meaningful for an investor, an asset class may not be a suitable investment for the investor.

6. Solution: C.

C is correct. Asset classes should have a return premium based on an underlying market risk factor (e.g., beta) and not any underlying skill of the investor. Strategies, on the other hand, involve combinations of asset classes with the objective of earning a return based on investment skill.

A is incorrect. There will be overlap of sources of risk when asset classes are defined, e.g., US and non-US equities, or even US small and large cap equities will have some risks in common, but there should be as few common risk factors as possible, and they should have only modest correlations.

B is incorrect. Emerging markets equities should be considered a distinct asset class as they differ from other equities in terms of diversification potential, informational efficiency, corporate governance, taxation, and currency convertibility.

Case 2: Kohler

1. Solution: A.

Standard 3 is not consistent with strategic asset allocation; it is tactical asset allocation that is based on short-term expectations and perceived short-term disequilibriums in markets. Strategic asset allocation sets an investor's desired long-term exposures to systematic risk. Investment objectives and constraints are inputs in determining strategic asset allocation.

2. Solution: A.

Outcome 1 is consistent with the ALM approach. The ALM approach to strategic asset allocation, which involves explicitly modeling liabilities and adopting the optimal asset allocation in relation to funding liabilities, characteristically results in a higher allocation to fixed-income instruments than an asset-only (AO) approach. Compared with AO, an ALM approach affords much more precision in controlling risk related to the funding of liabilities. The global market equilibrium portfolio is the default strategic asset allocation for the Black–Litterman AO approach.

3. Solution: A.

Roth would most likely criticize the specification of mid-cap equities because they are not mutually exclusive with respect to domestic large-cap and small-cap equities. Asset class specification should support the purposes of strategic asset allocation. Domestic large-, mid-, and small-cap equities are assets within the asset class of domestic equities and have little diversification benefit between them, with the correlation between their returns being very high.

Five criteria are helpful in effectively specifying asset classes:

1. Assets within an asset class should be relatively homogeneous.
2. Asset classes should be mutually exclusive.
3. Asset classes should be diversifying.
4. The asset classes as a group should make up the preponderance of world investable wealth.
5. The asset classes should have the capacity to absorb a significant fraction of the investor's portfolio without seriously affecting the portfolio's liquidity.

4. Solution: A.

Roth would obtain the smallest mean–variance improvement by including taxable municipal bonds. For an investor to gain by adding a new asset class, that asset class's Sharpe ratio must exceed the product of the existing portfolio's Sharpe ratios and the correlation of the asset class's return with the current portfolio's return. All three asset classes have similar low correlations with large-cap equities; however, with a negative Sharpe ratio, municipal bonds could never produce a greater product than the product of the other two positive inputs and the

existing portfolio's Sharpe ratio.

5. Solution: A.

Tactical asset allocation involves making short-term adjustments to asset class weights based on short-term predictions of relative performance among asset classes. Equities are forecast to perform 3% above their long-term outlook in the next six months; however, the weighted currencies are forecast to drop 3% (a gain of 3% in USD). Fixed income is forecast to return 3% less than the long-term outlook and is also forecast to be exposed to a 3% currency loss (a gain of 3% in USD). Real estate and real return assets are both forecast to perform above their long-term expected returns and are not exposed to a weakening in the currencies.

6. Solution: C.

The lack of market integration (or the absence of free cross-border capital flows) can be an advantage if it increases market segmentation and helps prevent correlations with other markets from rising. Increased integration of markets can decrease diversification benefits, whereas returns in segmented markets will be influenced mostly by a specific country's own macroeconomy and will be less subject to changes in correlations when volatility increases. Global correlations tend to increase in times of increased volatility and even appear to be conditional on global volatility. The efficient frontier and traditional mean–variance analysis using unconditional correlations would not apply because correlations remain low when returns are high but become high when returns are negative.

Case 3: Kirsch

1. Solution: C.

The plan's current investment policy is from an asset-only perspective given that the investment policy defines low-risk investments as assets that have low correlations with each other. An asset-only approach focuses on only the return and risk of the investment portfolio. The liability-relative perspective characterizes low-risk investments as those having a high correlation with liabilities.

2. Solution: B.

The plan does not have a liability-relative perspective because the benchmark for a defined benefit plan with a liability-relative perspective is an asset portfolio that mimics the plan liabilities, not a benchmark composed of equity, fixed-income, and cash instruments.

3. Solution: A.

For the inactive participants, the benefit payments are fixed because they are not indexed to inflation. Accordingly, these payments are bond like and their only market related exposure is the term structure of interest rates. The portfolio of assets that best mimics such a liability is a bond portfolio whose cash flows match the estimated benefit payments.

4. Solution: A.

The portion of the benchmark return for the future wage liabilities is 4% because wage increases are attributable to two economic forces: wage inflation (2%) and real wage growth (2%).

5. Solution: B.

Because the plan is not frozen but is closed and is indexed to inflation for the active employees, the relevant investment benchmark will mimic the (1) accrued benefit liability plus (2) future wage liability. For the accrued benefit liability, the market-related exposure is the term structure of interest rates and, accordingly, the appropriate liability-mimicking assets are nominal bonds. For the future benefit liability, the market-related exposures are inflation, economic growth, and term structure of interest rates. Consequently, the appropriate liability-mimicking assets are real rate bonds, equities, and nominal bonds.

6. Solution: B.

Strategy 3 reflects the liability-relative approach, which entails (1) hedging the economic exposure of the accrued benefits and (2) investing in higher return instruments in order to earn a return that is sufficient to fund the future wage benefits. Interest rate derivatives are an efficient

way to hedge the accrued benefits because the primary market-related exposure of the accrued benefits is the term structure of interest rates. Because derivatives are a capital-efficient (derivatives require less cash to create a position in comparison with a direct investment) method to hedge the primary market-related exposures, the balance of the investment portfolio may be used for higher return investments that are not benchmarked for risk purposes but that do provide returns that are designed to offset the need for the plan sponsor to make future cash contributions. The equity returns are not benchmarked for risk purposes because the interest rate derivatives are designed to hedge the plan's economic liabilities.

Case 4: Campos

1. Solution: C.

The domestic currency value of Dias's portfolio of foreign assets most likely increased because of changes in the domestic currency value of foreign asset holdings. The domestic currency return of the portfolio of foreign assets is: = 0.0858

The calculations show that the domestic currency value of the portfolio of foreign assets increased because of changes (i.e., increases) in the domestic currency value of UK and German equity investments.

Note $w_1 = 322,999,860/489,974,360 = 0.659$ and $w_2 = 166,974,500/489,974,360 = 0.341$

2. Solution: C.

Traldi is incorrect about the correlations and the currency overlay program. In the short run, if the correlation between foreign currency asset returns and foreign currency returns is negative, then there may be no need to hedge all foreign currency exposure because some currency exposure is desirable from a portfolio diversification perspective. Regarding the currency overlay program, it will add value to the portfolio only if the currency alpha has a low correlation with other asset classes in the portfolio (i.e., Brazilian equities and corporate bonds).

3. Solution: B.

An appropriate active currency management strategy that may add value to BC's portfolios would be to borrow in USD and invest in GBP. The spread in yields is widest between the United Kingdom and the United States, and the USD/GBP currency pair has the lowest implied volatility, which is better for a carry trade.

4. Solution: A.

A short strangle (short an equal number of 15-delta calls and puts) would only be appropriate if volatility is expected to be low. The expectation is for increased volatility, so the long strangles would be more appropriate. A strategy of taking long positions on an equal number of 50-delta calls and 50-delta puts (i.e., a 50-delta straddle) is an appropriate way to take advantage of expected increased volatility in the USD/EUR currency pair. However, 50-delta calls and puts are at-the-money options and are more expensive than out-of-the-money options, such as 25-delta calls and puts (a 25-delta strangle).

5. Solution: B.

Because of equity investments in Australia and Switzerland, FB has long currency exposure to AUD and CHF. The appropriate risk-neutral strategy is to over-hedge (hedge ratio > 1) AUD and

not hedge CHF. The AUD is selling at a forward premium of 2.27%, which means that the expected roll yield for a short hedge in AUD is 2.27%. Furthermore, the AUD is expected to depreciate by 3.28%, which means the short position in the AUD gains 3.28%. Thus, a short hedge of the AUD is appropriate. The CHF is at a forward discount of 2.64%, which means that the expected roll yield for a short hedge of CHF is -2.64%. The CHF is expected to appreciate 1.32%, which means that a short position in CHF would lose 1.32%. Thus, in this instance it would not be appropriate to hedge the CHF.

Currency Pair	Current Spot Rate	Six-month Forward rate	Six-Month Forecast Spot Rate	Forward prem/disc	Spot app/depr
BRL/AUD	2.1046	2.1523	2.0355	2.27%	-3.28%
BRL/CHF	2.5309	2.4641	2.5642	-2.64%	1.32%

6. Solution: C.

Campos suggests that both strategies help reduce hedging costs and allow the manager to exploit a market view. While it is true that both strategies help reduce hedging costs through premiums collected on short calls and puts, they both do not accommodate the market view on the currencies. Specifically, Exhibit 3 indicates that the expectation is for the AUD to depreciate to BRL/AUD 2.0355 and for the CHF to appreciate to BRL/CHF 2.5642. Strategy 1, the short seagull on the AUD only provides downside protection to BRL/AUD 2.1356 (when the short put kicks in and neutralized the hedge), not BRL/AUD 2.0355. Strategy 2 does allow for participation in upside gain to BRL/CHF 2.5669 at which point the short call kicks in. The expectation is for an appreciation to BRL/CHF 2.5642.

Case 5: Noir Rashwan

1. Solution: C.

For institutional investors like a large sovereign wealth fund with a long time horizon and little liquidity needs, a portfolio comprised largely of non-traditional investments where manager skill and an illiquidity premium can be earned is acceptable.

The problem large institutional investors may run into is not enough alternative investments available to invest in, like hedge funds, to meet their target asset allocation.

2. Solution: A.

A Minkara is displaying recency bias (also referred to as representative bias) when investors attach more importance to more recent data. In this case, he is placing more emphasis on the recent run up in real estate prices and equating that with similar events that led to the last global recession. Loss aversion is when the utility given up from a loss is greater than the utility derived from achieving a gain on an investment. In loss aversion, the investors sell winners too soon and hold onto losers too long in hope of gaining back some of their losses. Mental accounting is when assets (or liabilities) are separated into different buckets based on subjective criteria. There is no evidence of mental accounting in this particular situation.

3. Solution: A.

The after-tax standard deviation = pre-tax standard deviation $(1 - t)$ = 13% $(1 - 0.2)$ = 10.4%.

After-tax risk and return can significantly impact the efficient frontier; therefore, the post-tax standard deviation should be used as an input into the asset allocation process.

4. Solution: C.

Pre-tax allowable deviation is 15% - 10% = 5% or 10% - 5% = 5%.

Post-tax deviation = 5% / $(1 - t)$ = 5% / $(1 - 0.2)$ = 6.25% for a range of 3.75% to 16.25%

5. Solution: C.

He is exhibiting illusion of control in that he believes OPEC can control the world supply of oil. Changes in the economic environment can lead to major changes for optimization of asset allocation as changes in oil and gas production have significantly changed over the last decades. Home bias has to do with a preference to invest in securities listed on the exchanges of your home country. Framing bias has to do with answering a question differently depending upon how it is asked.

6. Solution: B.

Since long-term rates are not projected to increase, there would be no need to decrease the allocation to long-term bonds. The increase in short-term rates will make cash instruments like money market funds more attractive; high yield spreads means corporate bond prices are undervalued, allowing for opportunities to invest in investment grade and high yield bonds.

9. SS11 Alternatives

Case 1: Marion Knight Scenario

1. Solution: A.

The description of the hedge fund strategy for Client 1 best fits a global macro strategy. This strategy employs high leverage and returns can be volatile. Managed futures strategies tend to use systematic trading. Dedicated short-selling strategies tend to use bottom-up analysis.

2. Solution: B.

Merger arbitrage can be viewed as writing insurance on an acquisition. If the acquisition is completed as planned, the hedge fund earns the spread (an insurance firm keeps the insurance premium if no adverse event occurs). If the transaction fails, the hedge fund stands to lose money

(Analogous to an insurance company making a payout). Distressed securities investing uses low to moderate levels of leverage because of the volatility of the strategy and the long investment time horizon. A hard-catalyst event-driven strategy tends to be less risky and less volatile than a soft-catalyst strategy.

3. Solution: C.

Multi-strategy funds can reallocate funds more quickly and more easily because each of the constituent strategies is managed in-house. The fee structure of multi-strategy funds is often more attractive because netting risk is more likely to be absorbed internally.

4. Solution: A.

VIX index futures are exchange-traded and are very liquid. OTC contracts offer longer maturities but are subject to illiquidity and counterparty risk.

Case 2: Jake Montana Scenario

1. Solution: A.

A timber investment (private real asset) offers both growth and inflation-hedging potential. A long or short equity strategy (hedge fund) and distressed debt investment (private credit) have equity-like characteristics and are not primarily used for inflation-hedging.

2. Solution: B.

Risk factor exposures are sensitive to the period used for analysis. A liquidity risk factor can be incorporated into a risk factor-based approach. Overestimation of portfolio diversification is a limitation of traditional approaches to asset allocation.

3. Solution: B.

In constrained MVO, the optimization is prevented from selecting the most efficient allocation by the limits placed on the minimum and maximum weights for the different asset classes. As a result, the optimal portfolios obtained from constrained MVO will lie below those obtained from unconstrained MVO.

4. Solution: B.

Statement 1 is correct since a custom index proxy (e.g., S&P 500 + 2%) is unlikely to have the same risk-return characteristics as the alternative investments strategy. Statement 2 is incorrect because the providers of peer group benchmarks use very different construction rules.

10. SS15 Trading, Performance Evaluation, and Manager Selection

Case 1: Ahmed

1. Solution: B.

B is correct. The implementation shortfall is the difference between the money return on a paper portfolio based on the benchmark or decision price (\$25.50 in Exhibit 3) and the actual portfolio's money return and is calculated as follows:

Portfolio Money Returns	Price £	Number of Shares	Total £
Paper portfolio original cost	25.50	1,000	-25,500
Paper portfolio end value	26.75	1,000	26,750
Paper portfolio profit			1,250
Real portfolio	26.25	800	-21,000
Commission			-135
Real Portfolio total original cost			-21,135
Real portfolio end value	26.75	800	21,400
Real portfolio profit			265

Implementation Shortfall		
in £s: paper profit – real profit	1,250 – 265	985
As % of cost of paper portfolio	985 ÷ 25,500	3.86%
in basis points		386

2. Solution: A.

A is correct. Moore's statement is incorrect, only explicit costs such as the £135 commission cost should be included in assessing the trader's performance. The missed trading opportunity cost is also a result of market movement.

3. Solution: A.

A is correct. Direct market access would be most suitable for the order of JAK—a small order of a liquid stock trading on a well-organized market (LSE).

Case 2: Lancaster**1. Solution: C.**

The MWR can have upward (downward) bias relative to the TWR when large contributions are made just prior to a period of strong (weak) performance.

2. Solution: A.

If the Fund relaxes the appraisal criteria they are more likely to make a Type I error, retaining a poor manager.

3. Solution: B.

Pure sector allocation return = (portfolio weight – benchmark weight) x (benchmark return – benchmark total return) applied to Sector 1.

$$= (15\% - 10\%) \times (0.82\% - 1.13\%) = -0.02\%$$

4. Solution: B.

Within sector allocation return = (benchmark weight) x (portfolio return – benchmark return) applied to Sector 3 = $30\% \times (-0.62\% - (-0.38\%)) = -0.07\%$

5. Solution: A.

(Portfolio weight – benchmark weight) x (portfolio return – benchmark return) applied to Sector 5 = $(5\% - 20\%) \times (3.10\% - 0.69\%) = -0.36\%$

6. Solution: A.

The within sector allocation return only considers the manager's security selection within a sector. See the sentence just above example 14.

Case 3: Subramanium

1. Solution: B.

Subramanium is least accurate with respect to performance attribution. Performance attribution investigates the sources of the account's performance relative to a specific investment benchmark, not a manager's past performance.

2. Solution: C.

The ability of style indexes to pass tests of benchmark validity can be problematic as the definition of investment style implied in the benchmark may be ambiguous or inconsistent with the investment process of the manager being evaluated.

3. Solution: C.

The reason related to the option-like features is the least accurate. The denominator of the Sharpe ratio is the standard deviation of returns. However, the option-like features of many hedge funds make the use of standard deviation as a measure of risk questionable.

4. Solution: C.

The highest return per unit of systematic risk is measured by the Treynor measure. Of the given assets, the W-Life account has the highest Treynor measure.

$$T_A = \frac{(\bar{R}_A - \bar{r}_f)}{\hat{\beta}_A} \quad \bar{R}_A = \text{average asset return} \quad \bar{r}_f = \text{average risk free return}$$

$\hat{\beta}_A$ = ex post Beta of the asset

For the W-life account, it is $(15-4)/1.35=8.15$

5. Solution: B.

The null hypothesis is that the manager has no skill while the alternative is that the manager is skillful. The first statement describes a Type II error (not rejecting the null when it is incorrect) and the second statement describes a Type I error (rejecting the null when it is correct).

Case 4: Andrews

1. Solution: A.

The TWR is greater than the MWR because there is a large withdrawal of €2.5 million prior to significant fund growth of 9.6% (i.e., $[8.0/7.3] - 1 = 9.6\%$). In this case, the €1.5 million contribution prior to modest growth is inconsequential and, in isolation, would actually move the MWR to be greater than the TWR.

Day	Fund Value	Contribution/ (Withdrawal)	Fund Value with Contributions	Subperiod Return for TWR calculation:
0	9.5	0	9.5	
10	9.8	-2.5	7.3	$3.2\% = (9.8 \div 9.5) - 1$
25	8	1.5	9.5	$9.6\% = (8.0 \div 7.3) - 1$
30	9.6	0	9.6	$1.1\% = (9.6 \div 9.5) - 1$

2. Solution: A.

The incremental return contribution of the total fund is the total fund incremental value contribution ($\$120.33 - \$104.56 = \$15.77$ million) minus the net contributions ($\$1.21$ million) divided by the beginning value of the fund ($\$104.46$ million).

$$(120.33-104.56-1.21)\div104.56=14.56\div104.56=0.1393=13.9\%$$

3. Solution: C.

The existing data is macro attribution data and cannot be used to analyze a "small company" strategy. Industry sector micro attribution data are necessary, but at the individual firm level and not at the aggregate level. Otherwise, there is no means to determine whether the investment is in a small or large firm (i.e., based on the "fundamental factor" of firm size).

4. Solution: C.

Kinney's statement concerning the active return is correct because the active return is assessed by subtracting the benchmark return from the manager's portfolio return.

The portfolio return can be defined as $P = M + S + A$,

Where;

M = Return on market index

S = Return from manager's investment style ($B - M$)

B = Return on selected benchmark

A = Return from manager's active decisions

$P = P \Rightarrow P = B + (P - B) \Rightarrow P = B + A$ (where A = Active return). Doing what Kukar suggests and what Kinney states will be the active return: $P - B = A$

5. Solution: A.

The total value added return is the weighted average of the manager's portfolio return minus the weighted average of the benchmark return minus the trading costs.

Weighted average of manager's portfolio return: $20\% \times (-0.40\%) + (40\% \times 3.80\%) + (10\% \times 2.40\%) + (25\% \times 5.40\%) + (5\% \times 0.09\%) = 3.03\%$

Weighted average of benchmark portfolio return: $30\% \times (-0.70\%) + (30\% \times 4.20\%) + (20\% \times 2.60\%) + (20\% \times 2.92\%) = 2.15\%$

Total value added return, $rv = 3.03\% - 2.15\% - 0.27\% = 0.61\%$.

Case 5: Kim Simpson and Janet Long Scenario

1. Solution: C.

The paper portfolio performance = $100,000 \times (\$35.65 - \$35.00) = \$65,000$.

The actual portfolio performance = $90,000 \times (\$35.65 - \$35.41) - (90,000 \times \$0.02) = \$19,800$.

Implementation shortfall is, therefore, $\$65,000 - \$19,800 = \$45,200$.

2. Solution: B.

In this case:

$$\text{arrival cost} = \text{side} \times \frac{\text{execution price} - \text{arrival price}}{\text{arrival price}} \times 10^4 \text{bps}$$

where:

side = +1 for a buy, -1 for a sell

arrival price = market price when the order was transmitted to the market

In this case:

$$\text{arrival cost} = +1 \times [(\$35.41 - \$35.15) / \$35.15] \times 10^4 \text{ bps} = 73.97 \text{ bps}$$

3. Solution: B.

The fact that VWAP for a relevant stock index is lower than the index arrival price means that markets have been falling over the trade horizon.

This means the index cost will be negative, as defined by the following formula

$$\text{index cost} = \text{side} \times \frac{\text{index VWAP} - \text{index arrival price}}{\text{index arrival price}} \times 10^4 \text{bps}$$

The intuition here is that a falling market should lower the costs of traders buying securities.

Once this negative index cost (multiplied by a beta of 1) is subtracted from the arrival cost of the trade this will increase the market-adjusted cost of the trade.

4. Solution: C.

Good trade governance requires a policy in place for the aggregation of orders across multiple client accounts in order to ensure that clients are treated fairly when allocations are made on a pre-trade and post-trade basis. Answer A is incorrect since best execution is not defined simply by being the lowest cost broker—other factors need to be considered such as speed of execution, likelihood of execution and settlement, and the nature of the trade. Answer B is incorrect since a broker should disclose all execution venues used by the firm to clients.

Case 6: Education Investment Foundation Scenario

1. Solution: B.

When assessing the skill of managers, the null hypothesis is that the manager is not skillful. The alternative hypothesis therefore is that the manager does indeed have skill. A Type I error occurs when the null is incorrectly rejected (i.e., the fund hires a bad manager), and a Type II error occurs when the null is false but not rejected (i.e., the fund fails to hire good managers). The nature of both Purpose 1 and Purpose 2 of the policy is to monitor the subsequent performance of managers that have been rejected by the manager selection policy. The most likely reason for monitoring the subsequent performance of managers, who were rejected, is to detect Type II errors where a good manager is not hired by the fund due to a mistake.

2. Solution: A.

Returns-based style analysis (RBSA) uses a regression of fund returns against major risk factors to identify the risk exposures of the fund. In contrast, holdings-based style analysis (HBSA) looks at the current individual holdings of the fund and assess the style of the fund from these individual holdings. As such, the HBSA requires a higher level of data than RBSA; hence, the first consideration of lower data requirements implies RBSA would be more appropriate. The second consideration of mitigating the effects of window dressing also implies RBSA is more appropriate. Window dressing occurs when a manager changes their holdings shortly before a reporting date in order to change the perceived risk exposures of the fund. RBSA would be less affected by window dressing because the historical regressions look at average portfolio exposures over the regression period rather than being a current snapshot.

3. Solution: B.

For a gross return of 10% and a benchmark return of 5%, computed fees would be calculated as follows:

Schedule 1 fee = $0.50\% + 0.3[10\% - 5\%] = 2\%$. This is not higher than the maximum fee of 3%; hence, the manager will take 2%.

Schedule 2 fee = $0.75\% + 0.2[10\% - 0.75\%] = 2.6\%$.

Schedule 3 fee = $1.00\% + 0.1[10\% - 1.00\%] = 1.9\%$.

4. Solution: C.

Schedule 1 fee = 0.50%. This is not higher than the maximum fee of 3%; hence, the manager will take 0.50%.

Schedule 2 fee = 0.75%.

Schedule 3 fee = $1.00\% + 0.1[-10\% - 1.00\%] = -0.1\%$.

Case 7: Cameron Li and Rick Gleeson Scenario

1. Solution: B.

Statement 1 is correct. Trading large orders increases market impact compared to trading smaller orders, and this effect is further accentuated by higher trade urgency.

Statement 2 is incorrect. Trading with lower urgency is associated with higher execution risk because of the longer period of time over which the order is executed, meaning that the trade is exposed to price volatility and changing market conditions for longer.

2. Solution: B.

Trading cost = $(900 \times \$22.33 + 600 \times \$22.43 + 700 \times \$22.47 + 800 \times \$22.65) - 3,000 \times \$22.29 = \534 . The trading cost calculation uses the price of the shares when the trader releases the order to the market, not the portfolio manager's benchmark price.

3. Solution: C.

Arrival cost = $+1 \times [(\$22.47 - \$22.29) / \$22.29] \times 10,000 = 80.8 \text{ bp}$.

The arrival cost calculation uses the price of the shares when the trader releases the order to the market, not the portfolio manager's benchmark price.

4. Solution: A.

Arrival price algorithms are generally used for relatively small orders or liquid securities. These algorithms are also used for high urgency trades (e.g., to reduce execution risk).