

Tang

Kim Tang, CFA, is a consultant reviewing a hedge fund, CleanTech Research Fund. CleanTech invests in high-risk and volatile "clean technology" companies. CleanTech has adopted the CFA Institute Code of Ethics and Standards of Professional Conduct.

Tang examines the various forms of advertising used by CleanTech to attract new clients. In one of its advertising messages, CleanTech states, "We have a very experienced research team and are proud they are all CFA's. Several of our managers serve as volunteers for CFA Institute. CFA Institute recognizes their expertise, and as a result, you can rely on our team for superior performance results."

In reviewing CleanTech's marketing brochure, Tang reads the following statements:

Statement 1: The share prices of companies in the clean technology sector have increased recently because of the growing awareness of climate change issues and the rising cost of energy. There are many risks in this sector, some of which include new technology that is unproven. Also, the addition or removal of government incentives can make markets dysfunctional. Nevertheless, it is our opinion that returns in this area will continue to be above average for several years. In fact, our proprietary investment analytics software has determined that investments in green transportation companies are likely to double in value in the next six months based on a multiple factor regression analysis. Key risks associated with analytics software include the fact that they rely on historical data and that a set of unknown factors could interfere with the anticipated results. We will earn a 200% return over the next year on one of our solar power company investments based on sales projections we prepared, assuming that last year's generous tax incentives stay in place.

Statement 2: The CleanTech fund invests in publicly traded and highly liquid companies and is recommended only for investors who are able to assume a high level of risk. Last month, we invested in EnergyAlgae, a "green energy" company that partnered with a global energy firm early last year to create oil from algae. EnergyAlgae's market capitalization quadrupled shortly after the partnership was formed. Recently, EnergyAlgae also patented a waste plastic-to-oil process that produces oil at less than \$30 a barrel. One of the founders of CleanTech is on the board of EnergyAlgae, and information he gave us on the company's patent process led us to purchase additional stock in EnergyAlgae before the patent became widely publicized with the release of the company's semiannual financial report.* (*Information supporting the statements made in this communication is available upon request.)

When Tang asks CleanTech's founders for supporting documents related to their investment in EnergyAlgae, she is told that this information is based on third-party research from Slar Brokerage (Slar), who maintains all necessary records. Tang completes a due diligence exercise on this research and learns that Slar has used sound assumptions and rigor in its analysis of EnergyAlgae. In particular, Tang learned that Slar used, at a minimum, the following attributes to form the basis of the recommendation: the company's past three years of operational history, current stage of the industry's business cycle, an annual research update, a historical financial analysis, and a one-year earnings forecast.

Tang also learns that the founders of CleanTech are majority shareholders of Slar, which underwrote the public offering of EnergyAlgae. Additionally, CleanTech's analysts inform Tang that they did not need to look at the quality of Slar's research because one of their former colleagues recently left CleanTech and established the research department at the brokerage firm.

In researching EnergyAlgae, Tang finds that potential customers and suppliers of EnergyAlgae are highly skeptical of the claims made regarding the companies' respective products. She also contacts several energy companies and is unable to locate anyone who has even heard of EnergyAlgae. When Tang reviews CleanTech's trading activity in EnergyAlgae shares, she finds that CleanTech liquidated its position in EnergyAlgae soon after CleanTech's portfolio managers presented positive views on EnergyAlgae in a number of media interviews. In addition, many of CleanTech's employees also sold their shares in EnergyAlgae immediately after CleanTech sold its shares of the company. The share price of EnergyAlgae dropped dramatically after the stock sales made by CleanTech and its employees.

- 1.) CleanTech's advertising is *least likely* in violation of the CFA Institute Standards of Professional Conduct with respect to:
 - A. use of the CFA designation.
 - B. expected performance results.
 - C. managers' volunteer activities.
- 2.) In Statement 1, CleanTech management *most likely* violated the CFA Institute Standards of Professional Conduct with regard to their comments on:
 - A. clean technology sector returns.
 - B. investment analytics software.
 - C. solar power company investment.
- 3.) In Statement 2, CleanTech *most likely* violated which of the following Standards of Professional Conduct?
 - A. Material Nonpublic Information
 - B. Suitability
 - C. Misrepresentation
- 4.) To be in compliance with the CFA Institute Standards of Professional Conduct, CleanTech should *most likely* question the validity of Slar's research on EnergyAlgae for deficiencies in which of the following areas?
 - A. Earnings projections
 - B. Operational analysis
 - C. Annual research update

- 5.) Tang's *most* appropriate course of action concerning the relationship between CleanTech and Slar is to recommend that CleanTech:
- A. sever the relationship immediately.
 - B. communicate relevant information to all clients.
 - C. explain the ownership structure to all clients.
- 6.) The EnergyAlgae trades are *least likely* to have violated the CFA Institute Standards of Professional Conduct with regard to:
- A. share price distortion because of positive media presentations.
 - B. the order in which the shares were traded.
 - C. the adverse and skeptical opinions of EnergyAlgae products.

Vision

Vision 2020 Capital Partners (V2020) has operated for the last 10 years originating and brokering corporate finance deals through private placements in emerging and frontier markets. Because of slow economic growth globally, investment-banking deals have declined, and V2020 has struggled to generate enough fees to sustain its business. The board of directors of V2020, composed of corporate finance experts, has identified opportunities to generate a new revenue stream.

One such opportunity is the creation of a division to manage an Emerging and Frontier Market Balanced Fund (the Fund). The board has had several inquiries from clients asking for such a product. The board believes the Fund is an ideal business line to meet client demand and create monthly asset management fees. The board thinks the Fund should also be required to act as a buyer of last resort for all its corporate finance client's private placements. The board believes this arrangement would act as a major incentive for private businesses to use their corporate finance services, thereby increasing revenues from their primary business activity.

Because none of the V2020 board members or senior managers are experienced in asset management, the board hires Lauren Akinyi, CFA, an independent consultant who works with various clients in the asset management industry. She is asked to undertake a study on an appropriate structure for the Fund to meet both corporate finance and fund client needs. She is also asked to help V2020 set up policies and procedures for the new fund to make certain all capital market regulations have been followed.

The board informs Akinyi that the policies and procedures should also ensure compliance with the CFA Institute Asset Manager Code of Professional Conduct (Asset Manager Code).

Subsequently, in a report to the board, Akinyi makes the following recommendations concerning compliance with the Asset Manager Code:

Recommendation 1: V2020 should abide by the following principles of conduct:

- Principle 1: Proceed with skill, competence, and diligence;
- Principle 2: Act with independence and objectivity; and
- Principle 3: Provide client performance within three days after month-end.

Recommendation 2: To take advantage of their vast business experience, the board of directors should implement new policies. Specifically, the board should

- Policy 1: take an active daily role in managing the Fund's assets,
- Policy 2: designate an existing employee as a compliance officer, and
- Policy 3: disclose any conflicts of interest arising from their business interests.

Recommendation 3: To avoid any conflicts of interest between the investment banking business and the new fund management business, a separate wholly owned subsidiary should be created to undertake the fund management business. The Fund would then provide a 100%

guarantee to buy the private placements of the corporate finance clients without having to disclose to all clients the relationship between the two entities.

Recommendation 4: To ensure timely and efficient trades in each of the markets in which the Fund invests, only one stockbroker in each market should be used. The board should also consider buying an equity stake in each of the appointed brokers as an added profit opportunity.

After the Fund completes its first year of operations, V2020 receives a letter from its regulator. The notification imposes heavy fines for poor disclosures to its fund clients and mandates the replacement of the senior fund manager as a condition for the renewal of V2020's asset management license. The board challenges the ruling in court, stating that the Fund made the necessary full disclosures. After six months, not wanting to incur further expensive legal fees or waste more precious time, the board, without admitting or denying fault, settles out of court, paying a smaller fine. Subsequently, the senior fund manager is terminated but receives a multimillion-dollar bonus upon leaving. After the replacement of the senior fund manager, the license is renewed for a further year. The regulatory body, however, gives a warning that if the Fund has any future violations, their license will be permanently revoked. Subsequently, the Fund discloses to its clients that the regulator has renewed its license for one year after the termination of the senior fund manager, a condition of the renewal. They also disclose the out-of-court settlement and the fine paid.

- 1.) Given the board's intended purpose for starting the Fund, which of the following principles of conduct under the Asset Manager Code of Professional Conduct is *least likely* violated?
 - A. Act in a professional and ethical manner at all times.
 - B. Uphold the rules governing capital markets.
 - C. Act for the benefit of clients.
- 2.) Which of the principles in Akinyi's Recommendation 1 is *least likely* sufficient to meet the principles of the Asset Manager Code of Professional Conduct?
 - A. Principle 3
 - B. Principle 2
 - C. Principle 1
- 3.) Which of Akinyi's policies in Recommendation 2 would *least likely* comply with the Asset Manager Code of Professional Conduct and its general principles if implemented?
 - A. Policy 1
 - B. Policy 2
 - C. Policy 3
- 4.) Which of the following would be *most* effective to prevent any violation of the Asset Manager Code of Professional Conduct as reflected in Akinyi's Recommendation 3?
 - A. The Fund does not participate in any of V2020's private placements.

- B. V2020 discloses to all clients the relationship between V2020 and the Fund.
 - C. The Fund only retains a minority shareholding in V2020.
- 5.) If Recommendation 4 was implemented, which aspect of the Asset Manager Code of Professional Conduct would *most likely* be violated?
- A. Priority of transactions
 - B. Fair dealing
 - C. Best execution
- 6.) Does the Fund's disclosure to its clients regarding the renewal of the license *most likely* comply with the Asset Manager Code of Professional Conduct?
- A. Yes, the disclosure included the termination of the fund manager
 - B. No
 - C. Yes, the disclosure included the out-of-court settlement and payment of fine

Ptolemy

The Ptolemy Foundation was established to provide financial assistance for education in the field of astronomy. Tom Fiske, the foundation's chief investment officer, and his staff of three analysts use a top-down process that begins with an economic forecast, assignment of asset class weights, and selection of appropriate index funds. The team meets once a week to discuss a variety of topics ranging from economic modeling, economic outlook, portfolio performance, and investment opportunities, including those in emerging markets.

At the start of the meeting, Fiske asks the analysts, Len Tuoc, Kim Spenser, and Pier Poulsen, to describe The Ptolemy Foundation was established to provide financial assistance for education in the field of astronomy. Tom Fiske, the foundation's chief investment officer, and his staff of three analysts use a top-down process that begins with an economic forecast, assignment of asset class weights, and selection of appropriate index funds. The team meets once a week to discuss a variety of topics ranging from economic modeling, economic outlook, portfolio performance, and investment opportunities, including those in emerging markets.

At the start of the meeting, Fiske asks the analysts, Len Tuoc, Kim Spenser, and Pier Poulsen, to describe and justify their different approaches to economic forecasting. They reply as follows.

Tuoc: I prefer econometric modeling. Robust models built with detailed regression analysis can help predict recessions well because the established relationships among the variables seldom change.

Spenser: I like the economic indicators approach. For example, the composite of leading economic indicators is based on an analysis of its forecasting usefulness in past cycles. They are intuitive, simple to construct, require only a limited number of variables, and third-party versions are also available.

Poulsen: The checklist approach is my choice. This straightforward approach considers the widest range of data. Using simple statistical method, such as time-series analysis, an analyst can quickly assess which measures are extreme. This approach relies less on subjectivity and is less time-consuming."

The team then discusses what the long-term growth path for US GDP should be in the aftermath of exogenous shocks because of the financial crisis that began in 2008. They examine several reports from outside sources and develop a forecast for aggregate trend growth using the simple labor-based approach and appropriate data chosen from the items in Exhibit 1.

Exhibit 1: 10-Year Forecast of US Macroeconomic Data

Growth in real consumer spending	3.10%	Yield on 10-year Treasury bonds	2.70%
Growth in potential labor force	1.90%	Growth in total factor productivity	0.50%
Growth in labor force participation	-0.3%	Change in trade deficit	-0.5%
Growth in labor productivity	1.40%		

Upon a review of the portfolio and his discussion with the investment team, Fiske determines a need to increase US large-cap equities. He prefers to forecast the average annual return for US large-cap equities over the next 10 years using the Grinold–Kroner model and the data in Exhibit 2.

Exhibit 2: Current and Expected Market Statistics, US Large-Cap Equities

Expected dividend yield	2.10%	Expected inflation rate	2.30%
Expected repurchase yield	1.00%	Current P/E	15.6
Expected real earnings growth	2.60%	Expected P/E 10 years prior	15

The analysts think that adding to US Treasuries would fit portfolio objectives, but they are concerned that the US Federal Reserve Board is likely to raise the fed funds rate soon. They assemble the data in Exhibit 3 in order to use the Taylor rule (giving equal weights to inflation and output gaps) to help predict the Fed’s next move with respect to interest rates.

Exhibit 3: Current Data and Forecasts from the Fed

Statistic	Status	Value (%)
Fed funds rate	Current	3
	Neutral	2.5
GDP growth rate	Trend	4.5
	Forecast	3
Inflation	Target	2.5
	Forecast	3.2

To assess the attractiveness of emerging market equities, Fiske suggests that they use the data in Exhibit 4 and determine the expected return of small-cap emerging market equities using the Singer–Terhaar approach.

Exhibit 4: Data for Analyzing Emerging Markets

Asset Class	Standard Deviation	Correlation with GIM	Degree of Integration with GIM
Emerging small-cap equity	23%	0.85	65%
Global investable market (GIM)	7.00%		

Additional information

Risk-free rate: 2.5%

Illiquidity premium: 60 bps

Sharpe ratio for GIM and emerging small-cap equity: 0.31

Finally, after examining data pertaining to the European equity markets, the investment team believes that there are attractive investment opportunities in selected countries. Specifically, they compare the recent economic data with long-term average trends in three different countries, shown in Exhibit 5.

Exhibit 5: Relationship of Current Economic Data to Historical Trends: Selected European Countries

	Ireland	Spain	Hungary
Production	Above trend, declining	Well above trend	Below trend, rising
Inflation	Above trend, declining	Average, rising	Below trend, stable
Capacity utilization	Above trend	Average, rising	Below trend
Confidence	Average, declining	Well above trend	Below trend, rising
Fiscal/monetary policies	Cautionary	Restrictive	Stimulatory

- 1.) Regarding the approaches to economic forecasting, the statement by which analyst is *most* accurate?
- A. Poulsen
 - B. Tuoc
 - C. Spenser

- 2.) Using the data in Exhibit 1 and the labor-based method chosen by the team, the *most likely* estimate for the 10-year annual GDP growth is:
- A. 3.5%.
 - B. 3.6%.
 - C. 3.0%.
- 3.) Using the data in Exhibit 2 and Fiske's preferred approach, the estimated expected annual return for US large-cap equities over the next 10 years is *closest* to:
- A. 7.9%.
 - B. 7.6%.
 - C. 7.4%.
- 4.) Using the data in Exhibit 3 and the investment team's approach to predict the Fed's next move, the new fed funds rate will *most likely* be:
- A. 2.9%.
 - B. 2.1%.
 - C. 2.6%.
- 5.) Using the data in Exhibit 4 and Fiske's suggested approach, the forecast of the expected return for small-cap emerging market equities is *closest* to:
- A. 9.5%.
 - B. 8.9%.
 - C. 9.9%.
- 6.) Among the three countries examined by the investment team, which is in the *most* attractive phase of the business cycle for equity returns?
- A. Hungary
 - B. Ireland
 - C. Spain

Rogers

Ted Rogers is the director of a research team that analyzes traditional and non-traditional sources of energy for investment purposes. For traditional energy sources, a number of high-frequency historical data series are available. For non-traditional energy sources, the data are generally quarterly and tend to hide a great deal of the volatility that Rogers knows to exist because appraised values are used instead of market values. To supplement the quarterly data, Rogers's team uses an index of the top 30 firms in new and experimental technologies, called the "NEXT Index." Although not all of the firms in the NEXT are energy firms, the index is available as a weekly series. However, the NEXT does change its composite mix of firms frequently as firms in the index fail or are sold to larger firms that are not in the index.

To determine the correlation matrix within the different energy sectors, Rogers's team relies on a weighted average of correlations derived from multifactor models and historical correlations. Although the combined experience within the team favors emphasizing the correlations derived from the multifactor models, historical correlations are given a greater weight within the weighted average calculations to reduce the future expected performance estimates of different investment models being considered. This practice of purposefully understating the expected future performance of these investment models is viewed as a safety measure by the team and as a way to manage client expectations.

In a recent meeting, the team discussed how using the last two years of historical data for oil-related industries generated relationships between factors that had not existed in the past. One member of the team, Steve Phillips, stated: "The relationships reflect the fact that hurricane activity in the last two years has affected oil concerns worldwide. There is no reason to believe that such relationships will continue in the future."

Most of the team agreed with Phillips but conceded that a number of clients specifically requested an analysis of the previous two years of data with an expectation that new trends were emerging within the industry. The team decided to add more variables to the analysis in order to show that the relationships the team believed to be significant actually outweighed the importance of these recently found relationships. After adding several additional variables, the team found that the model did not improve in predictive ability, but the recently found relationships were indeed no longer significant.

- 1.) The quarterly data available for non-traditional energy sources are *best* described as data with a:
 - A. time-period bias.
 - B. smoothing bias.
 - C. survivorship bias.
- 2.) The NEXT Index data *most likely* reflects:
 - A. volatility clustering.
 - B. transcription errors.
 - C. survivorship bias.

- 3.) The approach taken by Rogers's team to calculate the correlation matrix is *best* described as which type of estimator?
- A. Historical
 - B. Shrinkage
 - C. Time series
- 4.) Which of the following psychological traps *best* describes the Rogers's team's decision to give historical correlation more weight in the correlation matrix?
- A. Prudence trap
 - B. Anchoring trap
 - C. Overconfidence trap
- 5.) Which of the following types of biases *best* describes Steve Phillips's statement about oil-related industry data?
- A. Time-period
 - B. Data-mining
 - C. Survivorship
- 6.) The decision to add variables to the oil-related industry analysis will *most likely* lead to a(n):
- A. regime-switching bias.
 - B. data-mining bias.
 - C. appraisal bias.

Rioja

Andres Rioja is the treasurer of Empresas Crianza. His duties have recently been expanded to include oversight of the firm's pension fund. Given his limited experience in overseeing investments, he is relying on an outside consultant. Rioja prepares a number of questions for his first meeting with the consultant, Manolo Priorat of Consulta Jerez.

Priorat starts the meeting by summarizing for Rioja the status of the defined benefit pension plan and makes the following statement:

The pension liability has a duration of 14 years and a present value of \$4 billion. The liabilities are discounted using the spot rate on high-quality long-term corporate bonds. Presently, the asset portfolio covers 87.5% of these liabilities and is invested entirely in fixed-income assets. The plan assets have fallen short of the pension liabilities over the past five years because their durations are not properly matched. I am concerned that Crianza has selected the wrong benchmark for the pension plan. The current benchmark is a weighted average of the benchmarks for the various strategies used in the investment of pension assets. I believe the appropriate benchmark should be the liability itself.

Priorat and Rioja review the fixed-income funds in which the pension assets are currently invested. Portfolio managers have been given the mandate to meet or exceed their respective benchmarks based on their investment styles. Details of the various portfolios are provided in Exhibit 1.

Exhibit 1: Portfolio Information

Portfolio	Duration (years)	Asset Value (\$ thousands)	Benchmark	Investment Style
Money market	0.25	175,000	3-Month US T-Bill	Active management
Mortgage-backed securities fund	3	700,000	Barclays Mortgage	Enhanced indexing
Emerging market bond fund	4.6	675,000	JP Morgan EMBI	Active management
Long corporate bond fund	14	1,575,000	Barclays Long Corporate	Active management
Treasury bond STRIPs	24	375,000	Barclays 20+Year STRIP	Pure bond indexing

Rioja updates Priorat on Crianza's current plans for the pension plan. Rioja states: "Crianza will make a \$500 million contribution to fully fund the plan and invest the funds in Treasury STRIPs. In addition, we would like to completely reallocate pension investments away from the fund that presents the greatest contingent claim risk and into the long corporate bond fund."

Rioja then asks Priorat, “I would like to understand the risk profile of each index benchmark we have assigned to the portfolio managers. What measures are available to do this?” Priorat responds,

There are several key measures that come to mind. Effective duration measures the sensitivity of the index’s price to a relatively small parallel shift in interest rates. For large non-parallel changes in interest rates, a convexity adjustment is used to improve the accuracy of the index’s estimated price change. Key rate duration measures the effect of shifts in key points along the yield curve. Key rate durations are particularly useful for determining the relative attractiveness of various portfolio strategies, such as bullet strategies versus barbell strategies. Spread duration describes how a non-Treasury security’s price will change as a result of the widening or narrowing of the spread contribution.

Rioja then asks about the rationale for active managers to do secondary market trades. Priorat responds,

Secondary market trades should be evaluated in a total return framework. The exception is the yield or spread pickup trade, which should be evaluated in the context of additional yield. Credit-upside trades provide an opportunity for managers to capitalize on unexpected upgrades. Curve-adjustment trades are yet another example of investors expressing their interest rate views in the credit markets in anticipation of interest rate changes.

Finally, Priorat offers further explanation of how active managers can add value. He notes,

Structural analysis of corporate bonds is an important part of active management. Credit bullets in conjunction with long-end Treasury structures are used in a barbell strategy. Callable bonds provide a spread premium that can be valuable to an investor during periods of high interest rate volatility. Put structures will provide investors with some protection in the event that interest rates rise sharply but not if the issuer has an unexpected credit event.”

- 1.) Is Priorat's statement with regard to selecting a benchmark for the pension plan *most likely* correct?
 - A. No, because Crianza should select a high-quality long-term corporate bond index as the benchmark
 - B. Yes
 - C. No, because the current benchmark is appropriate to measure each strategy's performance
- 2.) For which portfolio in Exhibit 1 is a sampling approach *most likely* to be used in an attempt to match the primary index risk factors?
 - A. Treasury STRIPs
 - B. Emerging market bond fund

C. Mortgage-backed securities fund

- 3.) If Rioja rebalances the portfolio as he proposes in his statement to Priorat, the dollar duration of the assets relative to the dollar duration of the liabilities is *most likely* to:
- A. fall well short.
 - B. be far exceeded.
 - C. be nearly matched.
- 4.) In Priorat's response to Rioja regarding the explanation of key measures of an index's profile, he is *most likely* correct regarding:
- A. key rate duration and incorrect regarding convexity adjustment.
 - B. spread duration and incorrect regarding effective duration.
 - C. convexity adjustment and incorrect regarding key rate duration.
- 5.) With regard to evaluating secondary market trades, Priorat is *least likely* correct with respect to:
- A. credit-upside trades.
 - B. yield/spread pickup trades.
 - C. curve-adjustment trades.
- 6.) Priorat is *most likely* correct with regard to which structural trade?
- A. Putables
 - B. Bullets
 - C. Callables

William Gatchell, CFA, is an investment analyst with the Sonera Endowment Fund. Sonera is considering hiring a new equity investment manager. In preparation, Gatchell meets with Anjou Lafite, another analyst at the fund, to review a relevant part of the endowment's investment policy statement:

Funds will be invested in the most efficient vehicle that meets the investment objective. Each manager must demonstrate the efficiency with which the tracking error they use delivers active return. In addition, each manager must consistently adhere to his or her stated style.

Gatchell is given the task of reviewing three investment managers and selecting a manager that is most likely to adhere to Sonera's investment policy statement. Information about the investment managers is shown in Exhibit 1.

Exhibit 1: Investment Manager Data

	Investment Manager		
	A	B	C
Assets under management (\$ millions)	1,325	3,912	524
Information ratio	−0.27	0.5	0.75
Small-cap value index, beta	0.95	0.98	1.05
Small-cap growth index, beta	0.32	0.43	0.48
Large-cap value index, beta	1.05	1.1	0.96
Large-cap growth index, beta	0.47	0.39	0.37
Manager-stated style	Value	Value	Growth
Manager-stated sub-style	Low P/E	High yield	Momentum

Gatchell is reviewing the fee structures proposed by the three investment managers. He finds the following reference in Sonera's investment policy statement:

The fee structure must be easy to understand and avoid undue complexity wherever possible. Also, the fee structure must be predictable, so Sonera can reasonably forecast these costs on a yearly basis as an input to the annual budgeting process.

He understands there are many different fee structures, and he wants to make sure he chooses the most appropriate one for the Sonera. Gatchell prepares a recommendation for the investment policy committee regarding the most appropriate fee structure.

Sonera has followed an active investment style for many years. Gatchell would like to recommend to the investment policy committee that a portion of the funds be invested using a passive investment style. His research shows there are a number of methods used to weight the stocks in an index, each having its own characteristics. The one key feature he believes is important is that the method chosen not be biased toward small-capitalization stocks.

Gatchell is also examining different ways to establish passive equity exposure. He states to Lafite:

There are a number of ways to get passive equity exposure; we can invest in an equity index mutual fund, a stock index futures contract, or a total return equity swap. Stock index futures and equity swaps are low-cost alternatives to equity index mutual funds; however, a drawback of stock index futures is that they have to be rolled over periodically. One advantage of investing in equity mutual funds is that shares can be redeemed at any point during the trading day.

Gatchell is reviewing the performance of another investment manager, Far North, which uses a value-oriented approach and specializes in the Canadian market. Gatchell would like to recommend to the investment policy committee that the fund diversify geographically. The information for Far North and the related returns are shown in Exhibit 2.

Exhibit 2: Far North—Return Information

	Rate of Return
Far North	14%
True active return	−1%
Misfit active return	5%

The investment policy committee reviews the information in Exhibit 2 and is not familiar with the terms “true active return” and “misfit active return.” Gatchell responds with the following statement:

The true active return is the return Far North made above its normal benchmark return. The misfit active return is the return Far North made above the investor’s benchmark return. The term “investor’s benchmark” refers to the benchmark the investor uses to evaluate performance for a given portfolio or asset class.

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- 1.) Based on Exhibit 1, which investment manager *most likely* meets the criteria established in the endowment's investment policy statement?
 - A. Manager B
 - B. Manager C
 - C. Manager A
 - 2.) Based on Exhibit 1, is there sufficient information for Gatchell to create and interpret the results of a style box?
 - A. No, because additional holdings data are required
 - B. Yes
 - C. No, because additional index data are required

- 3.) Which fee structure is *most* appropriate for Sonera, based on the criteria in the investment policy statement?
- A. An *ad valorem* fee structure
 - B. A performance-based fee structure with a high-water mark
 - C. A performance-based fee structure with a fee cap
- 4.) If the investment policy committee decides to accept Gatchell's recommendation to also use passive investing, the index structure that *least likely* meets Gatchell's requirement is:
- A. a price-weighted index.
 - B. an equal-weighted index.
 - C. a value-weighted index.
- 5.) In his statement to Lafite, Gatchell is *least likely* correct with respect to:
- A. periodic rollover.
 - B. redemption.
 - C. cost.
- 6.) Is Gatchell's statement regarding true active return and misfit active return correct?
- A. Yes
 - B. No, he is incorrect about misfit active return
 - C. No, he is incorrect about true active return

Whitney

Mark Whitney, CFA, is the chief investment officer of Granite State Partners, a fixed-income investment boutique serving institutional pension funds. Paula Norris, a partner at consulting firm Franconia Notch Associates, is conducting due diligence of Granite's capabilities. At a meeting, they go over a presentation Whitney has prepared.

The first page of the presentation addresses Granite's investment style for managing portfolios. It states:

"Granite adjusts the portfolio's duration slightly from the benchmark and attempts to increase relative return by tilting the portfolios in terms of sector weights, varying the quality of issues, and anticipating changes in term structure. The mismatches are expected to provide additional returns to cover administrative and management costs."

Norris asks Whitney about Granite's ability to successfully reflect, in its portfolios, its views on the market and the direction of interest rates. Whitney makes the following statements:

- Statement 1: Granite uses effective duration to measure the sensitivity of the portfolio's price to a relatively small parallel shift in interest rates. For large parallel changes in interest rates, we make a convexity adjustment to improve the accuracy of the estimated price change. We believe that parallel shifts in the yield curve are relatively rare; thus duration by itself is inadequate to capture the full effect of changes in interest rates.
- Statement 2: We address yield curve risk by using key rate durations. When using this method, we stress the spot rates for all points along the yield curve simultaneously. By changing the spot rates across maturities, we are able to measure a portfolio's sensitivity to those changes.
- Statement 3: We also measure spread duration contribution. This analysis is not related to interest rate risk. This measure describes how securities, such as corporate bonds or mortgages, will change in price as a result of the widening or narrowing of the spread to Treasuries.

Norris provides information on three clients she might refer to Whitney for portfolio management services and asks him to design a dedication strategy for each. Whitney makes the following recommendations:

- Client 1: This bank has sold a five-year guaranteed investment contract that guarantees an interest rate of 5.00% per year. I would purchase a bond with a target yield of 5.00% maturing in five years. Regardless of the direction of rates, the guaranteed value is achieved.
- Client 2: The defined benefit pension plan for this client has an economic surplus of zero. In order to meet the liabilities for this plan, I will construct the portfolio duration

to be equal to that of the liabilities. In addition, I will have the portfolio payments be less dispersed in time than the liabilities.

Client 3: This client's long-term medical benefits plan has known outflows over 10 years. Because perfect matching is not possible, I propose a minimum immunization risk approach, which is superior to the sophisticated linear program model used in the current cash flow matching strategy.

Norris asks Whitney what steps he takes to reestablish the dollar duration of a portfolio to the desired level in an asset/liability matching application. Whitney responds: "First, I calculate a new dollar duration for the portfolio after moving forward in time and shifting the yield curve. Second, I calculate the rebalancing ratio by dividing the original dollar duration by the new dollar duration and subtracting one to get a percentage change. Third, I multiply the new market value of the portfolio by the desired percentage change from step two."

Norris then asks Whitney, "What sectors are you currently recommending for client portfolios?" Whitney responds: "I recommend investing 25% of the portfolio in mortgage-backed securities because they are trading at attractive valuations. I would not, however, buy floating-rate securities because these do not hedge liabilities appropriately."

Norris asks how changing market conditions lead to secondary market trading in Granite's client portfolios. Whitney responds: "Our research teams run models to assess relative value across fixed-income sectors, which, combined with our economic outlook, leads to trade ideas. For example, our macroeconomic team currently is concerned about the situations in several sovereign nations and the spillover effect to capital markets. These issues range from geopolitical risks that will likely increase the price of oil to outright sovereign defaults or restructuring."

- 1.) The style of investing described in Whitney's presentation is *most likely*:
 - A. a full replication approach.
 - B. enhanced indexing by small risk factor mismatches.
 - C. active management by larger risk factor mismatches.
- 2.) Which of Whitney's statements with regard to implementing its market and interest rate views is *least likely* correct?
 - A. Statement 2
 - B. Statement 3
 - C. Statement 1
- 3.) Which of the following statements regarding Whitney's recommendations for Norris's three clients is *most likely* correct?
 - A. Client 2 will meet the necessary conditions for a multiple-liability immunization in the case of a non-parallel rate shift.

- B. Client 3 will require less money to fund liabilities with the proposed strategy relative to cash flow matching.
 - C. Client 1 will only achieve the guaranteed value if the term structure of interest rates is downward sloping.
- 4.) Is Whitney's approach to rebalancing a portfolio using dollar duration *most likely* correct?
- A. No, the steps do not provide the amount of cash needed for rebalancing
 - B. No, there is no need to move forward in time
 - C. Yes
- 5.) What are the two risks that Whitney is *most likely* exposed to, given his recommendations on sectors?
- A. Interest rate risk and contingent claim risk
 - B. Contingent claim risk and cap risk
 - C. Interest rate risk and cap risk
- 6.) Whitney's secondary trading rationale is *best* described as:
- A. credit-defense trades.
 - B. sector-rotation trades.
 - C. structure trades.

Lehigh

Anna Lehigh, CFA, is a portfolio manager for Brown and White Capital Management (B&W), a US-based institutional investment management firm whose clients include university endowments.

Packer College is a small liberal arts college whose endowment is managed by B&W. Lehigh is considering a number of derivative strategies to tactically adjust the Packer portfolio to reflect specific investment viewpoints discussed at a meeting with Packer's investment committee. At the meeting, the committee reviews Packer's current portfolio, whose characteristics are shown in Exhibit 1.

Exhibit 1: Packer Portfolio Characteristics

Investment	Amount (\$ millions)	Risk Measure
Mountain Hawk, Inc. common stock	20	Beta: 1.30
US large-cap stocks	30	Beta: 0.95
US mid-cap stocks	10	Beta: 1.20
Eurozone large-cap stocks (unhedged, US\$ equivalent)	10	Beta: 1.10
S&P 500 Index call options (notional amount)	10	Delta: 0.50
A rated corporate bonds	20	Duration: 5.0
Total	100	

Kemal Gulen, a member of the investment committee, asks Lehigh how she manages the risk exposure of the call options investment. Lehigh responds by stating that she ensures that her call option positions are delta hedged. She notes, however, that in some instances, at an option's expiration, the option gamma is very high and maintaining a delta hedged position becomes very difficult.

Lehigh intends to synthetically modify the duration of the corporate bond component of the portfolio to a target of 3.0 in anticipation of rising interest rates. Interest rate swap data are provided in Exhibit 2.

Exhibit 2: Pay-Fixed Interest Rate Swaps

Swap	Maturity	Duration
A	2 years	-2.125
B	3 years	-3.375
C	3.5 years	-3.625

Lehigh notes the holding of Mountain Hawk common stock. The shares were recently donated by an alumnus who mandated that they not be sold for three years. Lehigh provides three potential options strategies to use in order to benefit from changes in Mountain Hawk's stock price, which is presently \$100.00. Options strategies are provided in Exhibit 3.

Exhibit 3: Options Strategies for Mountain Hawk Stock

Strategy	Lower Strike (US dollars)	Upper Strike (US dollars)
Straddle	95	95
Bull (call) spread	105	110
Bear(put) spread	90	100

Lehigh tells the committee she believes US large-cap stocks will perform well over the next year. The committee agrees and wants B&W to adjust the beta of the US large-cap part of the portfolio to a target of 1.10 by purchasing large-cap futures contracts. Lehigh proposes purchasing 15 contracts. For each contract, the beta is 1.00 and the price is \$100,000.

The committee is concerned that Europe's sovereign debt crisis may lead to volatility in European stock markets and the euro currency. It considers the hedging strategies outlined in Exhibit 4

Exhibit 4: Hedging Strategies

Strategy	Forwards	Futures
1	Sell euro and buy US dollars	Buy US stock market
2	Sell euro and buy US dollars	Sell European stock market
3	Buy euro and sell US dollars	Sell European stock market

Finally, Lehigh discusses B&W's market view that over the next 24 months, mid-cap stocks will underperform small-cap stocks and the Libor rate will be less than the percentage increase in the small-cap index but greater than the percentage change in the mid-cap index. She recommends executing a swap transaction in order to alter the stock and bond allocation and thus capture the economic benefit of B&W's market view. The investment committee considers the swap strategies outlined in Exhibit 5.

Exhibit 5: Swap Strategies

Swap Strategies	Receive	Pay
Swap 1	Libor	Mid-cap index
Swap 2	Mid-cap index	Small-cap index
Swap 3	Small-cap index	Libor

-
- 1.) Lehigh's response to Gulen is *most likely* correct when the option is:

- A. out of the money.
 - B. in the money.
 - C. at the money.
- 2.) Based on the data in Exhibit 2, modifying the duration of the fixed-income allocation to its target will require an interest rate swap that has notional principal *closest* to:
- A. \$11,030,000.
 - B. \$17,777,000
 - C. \$9,412,000.
- 3.) If the price of Mountain Hawk stock declines to \$88.00, which options strategy will *most likely* have the highest value at expiration?
- A. Bull spread
 - B. Straddle
 - C. Bear spread
- 4.) Will Lehigh's purchase of US large-cap futures contracts *most likely* result in the committee's beta objective for the US large-cap investment being attained?
- A. No, because the beta will be above the target
 - B. Yes
 - C. No, because the beta will be below the target
- 5.) Given the committee's view about the sovereign debt crisis, which hedging strategy is *most likely* to result in Packer earning the US risk-free rate of return?
- A. Strategy 3
 - B. Strategy 1
 - C. Strategy 2
- 6.) Which of the following swaps will *least likely* capture the greatest economic benefit, based on the committee's 24-month market view?
- A. Swap 1
 - B. Swap 3
 - C. Swap 2

Manuel Silva is a principal at Raintree Partners, a financial advisory firm, and a specialist in providing advice on risk management and trading strategies using derivatives. Raintree's clients include high-net-worth individuals, corporations, banks, hedge funds, and other financial market participants.

One of Silva's clients, Iria Sampras, is meeting with Silva to discuss the use of options in her portfolio. Silva has collected information on S&P 500 Index options, which is shown in Exhibit 1.

Exhibit 1: Options Data for S&P 500 Stock Index
(options expire in six months; multiplier = \$100)

Exercise Price	Call Price	Put Price
\$1,100	\$95.85	\$42.60
\$1,125	\$80.50	\$48.00
\$1,150	\$64.70	\$60.00

At the beginning of the meeting, Sampras states: "My investment in Eagle Corporation stock has increased considerably in value, and I would like suggestions on options strategies I can use to protect my gains." Silva responds:

There are two strategies that you may want to consider: covered calls or protective puts. Covered calls provide a way to protect your gains in Eagle Corporation stock. Adding a short call to your long position in Eagle stock will provide protection against losses on the stock position, but it will also limit upside gains. A protective put also provides downside protection, but it retains upside potential. Unlike covered calls, protective puts require an upfront premium payment.

At the end of the meeting, Sampras asks Silva to provide a written analysis of the following option strategies:

Strategy A: A butterfly spread strategy using the options information provided in Exhibit 1.

Strategy B: A straddle strategy using the options in Exhibit 1 with an exercise price of \$1,125.

Strategy C: A collar strategy using the options information in Exhibit 1.

On 16 March 2012, First Citizen Bank (FCB) approached Silva for advice on a loan commitment. At that time, FCB had committed to lend \$100 million in 30 days (on 15 April 2012), with interest and principal due on 12 October 2012, or 180 days from the date of the loan. The interest rate on the loan was 180-day Libor + 50 bps, and FCB was concerned about interest rates declining between March and April. Silva advised FCB to purchase a \$100 million interest rate put on 180-day Libor with an exercise rate of 5.75% and expiring on 15 April 2012. The put premium was \$25,000. Libor rates on 16 March 2012 and 15 April 2012 were 6% and 4%, respectively. The

option was exercised on 15 April 2012, and the payoff was received on 12 October 2012. FCB has asked for a written evaluation of the success of the strategy.

On 15 October 2013, another client, Short Hills Corporation (SHC), indicates it expects to take out a \$25 million dollar loan on 15 December 2013. The loan rate is 90-day Libor + 100 bps. Interest and principal will be paid on 15 March 2014, 90 days after the loan is made on 15 December 2013. SHC is concerned about rising interest rates and has approached Silva for recommendations on addressing this issue. On Silva's advice, SHC purchases a \$25 million interest rate call on 90-day Libor with an exercise rate of 3.5%. The option premium is \$45,000, and it expires in 61 days, on 15 December 2013. If the option is exercised on 15 December 2013, the payoff will be received on 15 March 2014. SHC has asked Silva to provide a report on possible outcomes relative to potential interest rate scenarios.

- 1.) Is Silva's response to Sampras regarding reducing exposure to Eagle Corporation stock *most likely* correct?
 - A. No, he is incorrect about covered calls
 - B. No, he is incorrect about protective puts
 - C. Yes
- 2.) Based on the information in Exhibit 1, the maximum profit per contract for Strategy A is *closest* to:
 - A. \$9,015.
 - B. \$5,855.
 - C. \$2,545.
- 3.) Based on the information presented in Exhibit 1, the maximum loss per contract for Strategy B is *closest* to:
 - A. \$20,900.
 - B. \$10,350.
 - C. \$12,850.
- 4.) The expected volatility of the S&P 500, relative to market expectations, is *least likely* to be a factor in the decision to implement:
 - A. Strategy A.
 - B. Strategy C.
 - C. Strategy B.
- 5.) Based on Silva's advice, the effective annual interest rate for First Citizen Bank's loan is *closest* to:
 - A. 5.75%.
 - B. 4.56%.

- C. 6.38%.
- 6.) Assuming Silva's advice is followed and Libor rates are 5% and 6% on 15 October 2013 and 15 December 2013, respectively, the effective annual interest rate on Short Hills Corporation's loan is *closest* to:
- A. 3.50%.
- B. 5.42%.
- C. 4.64%.

Watanabe

Kamiko Watanabe, CFA, is a portfolio adviser at Wakasa Bay Securities. She specializes in the use of derivatives to alter and manage the exposures of Japanese equity and fixed-income portfolios. She has meetings today with two clients, Isao Sato and Reiko Kondo.

Sato is the manager of the Tsushima Manufacturing pension fund, which has a target asset allocation of 60% equity and 40% bonds. The fund has separate equity and fixed-income portfolios, whose characteristics are provided in Exhibits 1 and 2. Sato expects equity values to increase in the coming two years and, in order to avoid substantial transaction costs now and in two years, would like to use derivatives to temporarily rebalance the portfolio. He wants to maintain the current beta of the equity portfolio and the current duration of the bond portfolio.

**Exhibit 1: Tsushima Pension Fund
Equity Portfolio Characteristics**

Current market value	¥27.5 billion
Benchmark	Nikkei 225 Index
Current beta	1.15

**Exhibit 2: Tsushima Pension Fund
Bond Portfolio Characteristics**

Current market value	¥27.5 billion
Benchmark	Nikko Bond Performance Index composite
Current duration	4.75

In order to rebalance the pension fund to its target allocations to equity and bonds, Watanabe recommends using Nikkei 225 Index futures contracts, which have a beta of 1.05 and a current contract price of ¥1,525,000, and Nikko Bond Performance Index futures, which have a duration of 6.90 and a current contract price of ¥4,830,000. She assumes the cash position has a duration of 0.25.

Sato wants to know if other derivatives could be used to rebalance the portfolio. In response, Watanabe describes the characteristics of a pair of swaps that, together, would accomplish the same rebalancing as the proposed futures contracts strategy.

Kondo manages a fixed-income portfolio for the Akito Trust. The portfolio's market value is ¥640 million, and its duration is 6.40. Kondo believes interest rates will rise and asks Watanabe to explain how to use a swap to decrease the portfolio's duration to 3.50. Watanabe proposes a strategy that uses a pay-fixed position in a three-year interest rate swap with semi-annual payments. Kondo decides he wants to use a four-year swap to manage the portfolio's duration. After some calculations, Watanabe tells him a pay-fixed position in a four-year interest rate swap with a duration of -2.875 would require a notional principal of ¥683 million (rounded to the nearest million yen) to achieve his goals.

Kondo asks Watanabe whether it would be possible to cancel the swap prior to its maturity. Watanabe responds with three statements:

- Statement 1: If you purchase a swaption from the same counterparty as the original swap, it is common to require the payments of the two swaps be netted or cash settled if the swaption is exercised.
- Statement 2: You could purchase a payer swaption with the same terms as the original swap. This approach would protect you from falling fixed swap rates but at the cost of the premium you would pay to the swaption counterparty.
- Statement 3: During the life of the swap, you could enter into a new pay-floating swap with the same terms as the original swap, except it would have a maturity equal to the remaining maturity of the original swap. However, the fixed rate you receive might be lower than the fixed rate you are paying on the original swap.
-

- 1.) The number of Nikko Bond Performance Index futures Sato must sell to rebalance the Tsushima pension fund to its target allocation is *closest to*:
 - A. 743.
 - B. 149.
 - C. 1,594.
- 2.) The number of Nikkei 225 Index futures Sato must buy to rebalance the Tsushima pension fund to its target allocation is *closest to*:
 - A. 4,148.
 - B. 3,293.
 - C. 3,950.
- 3.) Which of these is *most likely* to be a characteristic of one of the two swaps Watanabe describes to Sato?
 - A. Receive return on Nikko Bond Performance Index
 - B. Pay return on Nikkei 225 Index
 - C. Receive Libor
- 4.) The duration of the swap in Watanabe's first proposal to Kondo is closest to:
 - A. -1.75.
 - B. -2.00.
 - C. -2.75.
- 5.) Is the notional principal of the swap Watanabe recommends to Kondo *most likely* correct?
 - A. No, it is too high

- B. Yes
- C. No, it is too low

6.) Which of Watanbe's three statements to Kondo is *least likely* correct?

- A. Statement 3
- B. Statement 1
- C. Statement 2