

## 2013 Level III Mock Exam

The 2013 Level III Chartered Financial Analyst (CFA®) Mock Examination has 60 questions. To best simulate the exam day experience, candidates are advised to allocate an average of 18 minutes per item set (vignette and 6 multiple choice questions) for a total of 180 minutes (3 hours) for this session of the exam.

Questions	Topic
1–12	Ethical and Professional Standards
13-18	Risk Management
19-24	Equity Portfolio Management
25-30	Performance Attribution
31-36	Fixed Income Portfolio Management
37-48	Risk Management Applications of Derivatives
49-54	Portfolio Management of Global Bonds
55 -60	Global Investment Performance Standards
<b>Total:</b>	<b>180</b>

## Questions 1 to 12 relate to Ethical and Professional Standards

### Sue Kim Case Scenario

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Sue Kim, CFA, is a hedge fund manager who specializes in biotechnology stocks. Kim has spent many years investing in biotech companies and in the past, worked as an equity portfolio manager for a large bank with substantial research capabilities. Two years ago, Kim started a hedge fund, Green Note Investments. She manages accounts for several wealthy individuals. Now that she no longer has the resources of the bank to support her research, Kim relies on a network of experts to help her search for profitable investment opportunities in the biotechnology area. These experts include legal, business, and political contacts.

Kim purchases information from several biotechnology company employees, none of whom are officers of their respective companies, who perform work outside their regular positions as biotechnology consultants or experts. These consultants work with Kim without the knowledge of their employers, none of which has a prohibition on outside employment, and provide her with information about quarterly earnings and other confidential data related to their companies' performance. Kim bases her final investment decision on this information and encourages the consultants and experts she works with to publicly disclose the information that has been passed on to her.

In order to spread the news about the positive returns Green Note has achieved, Kim hires a public relations consultant, Takehiko Akagi, CFA. Akagi tells Kim that for a marketing campaign to be effective, she needs a five-year return history. Kim tries to retrieve her performance history from the bank but is denied this request. Searching her home laptop computer, Kim finds her historical bank performance data. Kim uses this bank data to recreate the first two years of the requested five-year performance history. For the third year she simulates her investment performance by applying Green Note's current investment strategy to historical data, which she discloses in a footnote along with information about whether the performance is gross or net of fees. For the final two years, Kim uses the actual performance history of Green Note.

Because the marketing campaign takes longer than expected to accomplish its goal of bringing new clients to the fund, Kim asks Akagi to accept a revised fee arrangement. Instead of paying Akagi a monthly fee of \$10,000 for his services marketing the fund, Kim proposes an investment management fee sharing arrangement. For each client Akagi brings to Kim and whom she signs on as an investor in Green Note, Kim will pay Akagi a fee of 10% of the investment management fee she charges that client for his first 24 months in the fund. Akagi agrees to this arrangement, and Kim makes sure to disclose this to prospective clients by verbally telling them that Green Note compensates Akagi for his efforts to find investors for the fund, which is the first time clients are made aware of this arrangement. Akagi also discloses to each client the fee he expects to earn from this arrangement once an investment management agreement is signed.

Kim's former university roommate, Donna Miriam, is now a legal expert in mergers and acquisitions. Miriam has a number of connections to senior associates who specialize in this area of law at large, well-known law firms. Miriam updates Kim when she hears a deal is about to be completed. Kim uses this information as part of a mosaic of information she gathers from her own research and information from other experts in her network. Once Kim has determined Miriam's information is likely to be correct, Kim

trades derivative securities of the acquisition target. In the past 18 months, her merger and acquisition investments have resulted in profits of \$10 million for the hedge fund. Kim also manages a separate account for Miriam, who has authorized Kim to replicate the trades in the acquisition targets for her account. Because Miriam provides this valuable information, Kim makes sure she trades Miriam's account before any other client trades.

Julian Huang, a government lobbyist, is another key member of Kim's expert network. Huang keeps in constant contact with the many lobbyists involved in biotechnology issues and has close relations with many legislators. Recently, legislators proposed restricting biotechnology research. If the legislation had passed, it would have reduced valuations across the board for biotech stocks. Kim led the hedge fund industry's efforts to fight this change. She personally donated a large sum of money to support these efforts and was also very successful in raising funds from the hedge fund community to fight the passing of this proposed legislation.

Kim's efforts to grow her fund result in new clients and rapid growth of assets under management. Faced with a significant increase in her workload, Kim realizes she needs to change her investment process to meet these new demands. In order to bring specialized experience to her investment decision-making process, Kim hires several competent outside advisers to sit on her investment committee, using her standardized criteria for adviser selection. Kim also subscribes to several well-known third-party research vendors not considered previously because of their high expense. With increased fees earned from additional assets under management, Kim can now afford to request information from these vendors that is tailored to her specific needs. Because this research is so specialized and detailed, and because Kim is confident that the outside advisers use diligence and a reasonable basis in their research, she is able to use the reports, with a few minor changes, as her own. Other than showing off her new reports, Kim does not tell clients of the changes made to her investment process and reports.

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1. By Kim executing trades based on the information she receives from the biotechnology consultants employees, she *least likely* violates the CFA Institute Standards of Professional Conduct concerning:
  - A. Market Manipulation.
  - B. Diligence and Reasonable Basis.
  - C. Material Nonpublic Information.
  
2. With regard to Green Notes's five-year investment performance history, Kim is *inconsistent* with the CFA Institute Standards of Professional Conduct concerning which of the following?
  - A. Performance as a hedge fund manager
  - B. Simulated performance of current strategy
  - C. Performance when she was an equity portfolio manager

3. With regard to Kim's fee arrangements with Akagi, whose actions are *inconsistent* with the CFA Institute Standards of Professional Conduct?
  - A. Kim's
  - B. Akagi's
  - C. Both Kim and Akagi's
  
4. Kim's relationship with Miriam is *inconsistent* with the CFA Institute Standards of Professional Conduct concerning:
  - A. Fair Dealing.
  - B. Priority of Transaction.
  - C. Material Nonpublic Information.
  
5. With regard to biotech legislation lobbying, is Kim consistent with the CFA Institute Standards of Professional Conduct?
  - A. Yes
  - B. No, because of her efforts to influence legislation
  - C. No, because she mixed personal and hedge fund donations
  
6. Which of Kim's changes made as a result of having more assets under management is consistent with the CFA Institute Standards of Professional Conduct?
  - A. Use of outside advisors
  - B. Client communications
  - C. Use of third-party research

### **Athena Case Scenario**

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Caitlyn Wilson, CFA, recently started her own asset management company, Athena Investment Services (Athena). The board of directors of Athena has adopted both the CFA Code of Ethics and Standards of Practice and the CFA Institute Asset Manager Code to institutionalize ethical behavior within the firm. The board also implemented half-yearly staff performance reviews, including an assessment of each manager's ability to ensure his department's compliance with the Code.

Six months into the first financial year, Wilson meets with all of her managers to assess each department's compliance. Wilson asks her compliance officer, Mark Zefferman, CFA, to make an opening statement to set the right tone for the meeting. Zefferman states, "At a minimum, we are

responsible for implementing procedures addressing the general principles embedded in the six components of the Code: As stated below, we must:

- Statement 1: Act with skill, competence and diligence while exhibiting independence and objectivity when giving investment advice;
- Statement 2: Put our clients' interests above the firm's when appropriate and act in a professional and ethical manner at all times; and
- Statement 3: Communicate with our clients in a timely and non-misleading manner and obey all rules governing capital markets."

Zefferman adds, "With regard to the last statement, please be aware we must implement the new Anti-Money Laundering Regulations being introduced by our local regulator with effect from the first quarter of next year. I've done an analysis of the new regulations and have found that all of the local requirements are part of new regulations recently introduced in Europe, where only a few of our clients reside. When we start taking on new clients based in Singapore in the second half of next year, we will also need to follow that country's anti-money laundering regulations. The local anti-money laundering legislation appears to be embedded in the Singapore regulations as well."

Wilson states, "I would like each of you to explain how the implementation of the Asset Manager Code within your department is being supervised. Let's start with Shenal Mehta, our client service manager."

Mehta states, "With respect to the Asset Manager Code relating to client services, we have ensured we enforce the following policies: All disclosures are accurate and complete, and our calculations are shown, no matter how complicated. We also ensure the client sees some sort of communication from us when they request it and that the marketing material sent to clients is checked by the compliance department for accuracy and completeness."

Anders Peterson, CFA, chief investment officer, states, "In addition to what Mehta has said, I have the following comments:

- Comment 1: Any communication with clients is kept confidential and is only accessible by authorized personnel;
- Comment 2: On occasion, we are able to acquire securities we expect will be particularly strong performers, such as oversubscribed initial public offerings. In order to assure that all clients are treated fairly, each client portfolio is given the same number of shares; and
- Comment 3: A gift and entertainment policy is in place to help ensure that our managers and analysts keep their independence and objectivity."

Richard Gilchrist, head of portfolio administration, then adds, "Our portfolio policies call for all assets to be valued at fair market prices using third-party pricing services. When a security price is not available from the service, a committee whose members have experience in valuing illiquid assets uses the hierarchy dictated by GIPS to determine values."

Wilson concludes the meeting by mentioning that Athena must do even more to ensure its clients continue to have faith in Athena's ability to protect and grow their assets. She recommends they disclose their risk management practices, which identify, measure, and manage the various risk aspects of the business to clients and the regulator. She adds, "In addition, we need to create a business continuity plan covering data backup and recovery, alternate trading systems if the primary system fails,

and methods to communicate to employees, critical vendors, and suppliers in case of an emergency that could disrupt normal business functions.”

7. Which of Zefferman’s opening statements is *inconsistent* with the Asset Manager Code of Professional Conduct?
  - A. Statement 1
  - B. Statement 2
  - C. Statement 3
  
8. Which of the following anti-money-laundering laws must Athena currently comply with to be consistent with the CFA Institute Standards of Professional Conduct?
  - A. Local
  - B. European
  - C. Singaporean
  
9. Which of Mehta’s client service policies is consistent with the Asset Manager Code?
  - A. Types of disclosures
  - B. Communication timing
  - C. Marketing material reviews
  
10. Which of Peterson’s comments is *inconsistent* with the Asset Manager Code?
  - A. Comment 1
  - B. Comment 2
  - C. Comment 3
  
11. Are Gilchrist’s comments regarding portfolio valuation consistent with the Asset Manager Code?
  - A. Yes
  - B. No, with regard to third-party pricing services
  - C. No, with regard to the process used to price illiquid securities
  
12. Are Wilson’s closing remarks consistent with recommended practices and procedures designed to prevent violations of the Asset Manager Code?

- A. Yes
- B. No, with regard to the business continuity plan
- C. No, with regard to disclosure of the firm's risk management process

## Questions 13 to 18 relate to Risk Management

### Laura Hackett Case Scenario

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Laura Hackett is a risk management consultant who helps investment companies build and enhance their risk management process. Jardins Advisors, a financial services firm with equity, fixed income, and commodity trading desks, recently hired her to evaluate and recommend improvements to their processes. Jardins' senior management outlines their current risk management process to Hackett as follows: "First, we establish policies and procedures for risk management. Next, we identify the types of risk we face. We then measure our exposures to those risks. Finally, we determine our risk tolerance and adjust levels of risk as appropriate." They ask her, "Is this process appropriate?"

Alpha Asset Management Inc., another of Hackett's clients, hired her to identify and separate its market risk exposures into categories. Alpha was incorporated during the current year and focuses on one investment strategy to generate returns. Alpha issues debt with a maturity of less than one year and invests the proceeds in emerging market debt. Hackett creates a list of Alpha's market risk categories.

Hackett asks Anthony Mackenzie, a recently hired associate, to apply the analytical method to estimate the VAR for Alpha Asset Management's portfolio, which is valued at \$20 million. The portfolio has an expected annual return of 7.5% and a standard deviation of 22.4%.

Another of Hackett's clients is Beta Investment Advisors. Beta invests in a variety of asset classes and international markets. It uses a historical simulation approach to measure the VAR of its portfolio, based on the previous 24 months of market data. Beta asks Hackett to evaluate its approach relative to other methods used for estimating portfolio VAR.

Sigma Investment Management Inc. is a potential new client that wishes to measure the credit risk of an over-the-counter American call option on a security. The call option has a strike price of \$65 and was purchased at a price of \$3.50 per option. The option's current value is \$8.50 per option.

In addition to measuring credit risk, Sigma asks Hackett to evaluate its over-the-counter derivative positions and recommend ways to decrease credit risk associated with these positions. Sigma provides a thorough explanation of its current process. At least 20 counterparties are used, each is limited to 7% of Sigma's total derivatives positions, and each must meet a minimum credit rating threshold. The contracts have a typical term of two years, at which time they are marked to market and all payments under the contract are netted and gains or losses settled.

13. What response would Hackett *most likely* make to Jardins Advisors' senior management? The firm should:
- A. measure its risk levels before defining its risk tolerance.
  - B. define its risk tolerance before identifying the risks it faces.
  - C. identify the risks it faces before setting policies and procedures.
14. Which of these risk categories is *least likely* to be on Hackett's list for Alpha?
- A. Political risk
  - B. Liquidity risk
  - C. Interest rate risk
15. Assuming normally distributed returns, the 5% yearly VAR for the Alpha Asset Management portfolio is *closest to*:
- A. \$2,980,000.
  - B. \$5,892,000.
  - C. \$8,052,000.
16. Hackett's description of Beta's current approach to VAR estimation would *most likely* mention that it:
- A. is a nonparametric method of estimating VAR.
  - B. often assumes a daily portfolio expected return of zero.
  - C. produces a wide range of randomly generated potential outcomes.
17. If the security held by Sigma Investment Management trades at \$70, the credit risk is *closest to*:
- A. \$3.35.
  - B. \$5.00.
  - C. \$8.50.
18. Sigma can *most likely* reduce credit risk in its over-the-counter derivatives positions by changing which of the following practices?
- A. Netting
  - B. Limiting counterparty exposure
  - C. Frequency of marking-to-market



## Questions 19 to 24 relate to Equity Portfolio Management

### Sonera Endowment Fund Case Scenario

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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 take on delivers active return. In addition, each manager must consistently adhere to his 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 found 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	0.50	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	1.10	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 the 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 Endowment Fund. He prepares a recommendation to 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 feels is important is that the method chosen not be biased towards 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 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 employs 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 found 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.”

19. Based on Exhibit 1, which investment manager *most likely* meets the criteria established in the endowment’s investment policy statement?

- A. Manager A
- B. Manager B
- C. Manager C

20. Based on Exhibit 1, is there sufficient information for Gatchell to create and interpret the results of a style box?

- A. Yes
- B. No, because additional index data are required
- C. No, because additional holdings data are required

21. 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 fee cap
- C. A performance-based fee structure with a high water mark

22. 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. a value-weighted index.
- C. an equal-weighted index.

23. In his statement to Lafite, Gatchell is *least likely* correct with respect to:

- A. cost.
- B. redemption.
- C. periodic rollover.

24. Is Gatchell's statement regarding true active return and misfit active return correct?

- A. Yes
- B. No, he is incorrect about true active return
- C. No, he is incorrect about misfit active return

## Questions 25 to 30 relate to Performance Attribution

### Minglu Li Case Scenario

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REDD Partners specializes in forecasting and consulting in particular sectors of the equity market. Minglu Li is an analyst for REDD Partners who specializes in the consumer credit industry. Last year (2012), Li and her team gathered data to determine the expected return for the industry (see Exhibit 1).

#### Exhibit 1

#### Returns and Premiums Data (2012)

Securities and Interest Rates	Expected Yield
10-year U.S. Treasury securities	3.8%
Short-term real rate	2.0%
Long-term real rate	2.3%
10-year AA corporate bond yield	4.4%
Type of Premium	Premium

Inflation premium	0.6%
Illiquidity premium	0.9%
Equity risk premium	8.4%

After considering a number of approaches, Li and her team decided to use the bond-yield-plus-risk-premium method. The method worked well in 2012, but a new assignment presented to Li's team the previous week posed a new challenge.

A new consumer credit mechanism was being tested on a small scale using a "smart phone" application to pay for items instead of the traditional credit card. The application had proved successful in the use of microloans in developing countries and was now being applied to a much broader consumer base. The new challenge for Li's team is to develop a model for the expected return for these new consumer credit companies, called "smart credit" companies, that combine the consumer credit industry and what traditionally was considered the telecommunications industry.

Although smart credit company returns data are sparse, a five-year monthly equally weighted index called the Smart Credit Index (SCI) was created from the existing companies' returns data. The number of companies in the index at a given time varies as a result of firms failing and also combining through time.

The SCI risk premium, equal to the SCI return less the risk-free rate, denoted as SCIRP, is used as the dependent variable in a two-factor regression where the independent variables are index returns less the risk-free rate for the consumer credit industry (CCIRP) and the telecommunications industry (TELIRP). The regression results are in Exhibit 2.

**Exhibit 2**  
**Data, Statistics, and Regression Results**

Index	Mean	Variance	
SCIRP	5.4%	0.2704	
CCIRP	4.6%	0.0784	
TELIRP	2.8%	0.1024	
Note: CCIRP and TELIRP are uncorrelated.			
Regression Coefficient	$\alpha$	$\beta$ (CCIRP)	$\beta$ (TELIRP)
Coefficient Value:	0.011	1.020	1.045
Note: All coefficients are statistically significant at the 95% level.			

Although volatility information is available from the SCI data and correspondingly for the SCIRP, Li's team wants to determine the statistical relationship between the SCIRP and both the consumer credit index risk premium (CCIRP) and the telecommunications index risk premium (TELIRP) because forecasting the CCIRP and TELIRP is much less difficult than forecasting the SCIRP. After some discussion, the team believes that the volatility measure for the SCIRP data based on the volatility of CCIRP and TELIRP through the regression should be adjusted to incorporate a correlation coefficient of 0.25 between the CCIRP and TELIRP. Although the two index risk premiums were uncorrelated in the past and within the regression, Li's team believes the two technologies will become more correlated in the future.

Li's team also examined survey data within the consumer credit and telecommunications industries during the same time period for which the actual data was collected. They found that projections in the surveys of the CCI and TELI tended to be more volatile than the actual data. Li's team has decided not to make any adjustments, however, because a definitive procedure could not be determined.

Given the effect of short-term interest rates on consumer credit, Li's team then decides to determine where the short-term interest rate is expected to be in the future. The Central Bank recently issued a statement that 2.5% appeared to be the appropriate rate assuming no other factors. Li's team then considers potential factors that may make the Central Bank behave differently from the 2.5% rate in the statement (see Exhibit 3).

**Exhibit 3**  
**Central Bank Factors**

GDP growth forecast	2.0%
GDP growth trend	1.0%
Inflation forecast	1.5%
Inflation target	3.5%
Earnings growth forecast	4.0%
Earnings growth trend	2.0%

Based on Taylor's rule with an assumption of equal weights applied to forecast versus trend measures, the short-term rate is expected to increase from the current 1.23% and the yield curve is expected to flatten.

For further insight, Li decides to consult an in-house expert on central banking, Randy Tolliver. Tolliver states that a flat yield curve is consistent with tight monetary and tight fiscal policies.

25. Based on Exhibit 1 and the method used by Li's team, the expected return for the consumer credit industry in 2012 was *closest* to:

- A. 12.2%.
- B. 12.8%
- C. 13.7%.

26. The SCI data *most likely* exhibits which type of bias?

- A. Time period
- B. Data mining
- C. Survivorship

27. Based on the correlation that Li's team believes to exist between the CCIRP and TELIRP, the new volatility for the SCIRP is *closest* to:

- A. 31.8%.
- B. 49.1%.
- C. 56.4%.

28. A comparison between the survey data containing projections of the CCI and TELI and the actual CCI and TELI *most likely* exhibits:

- A. a status quo trap.
- B. a recallability trap.
- C. *ex post* risk being a biased measure of *ex ante* risk.

29. Based on how the Taylor rule is applied by Li's team, the Central Bank's optimal short-term rate is *closest* to:

- A. 1.5%.
- B. 2.0%.
- C. 2.8%.

30. Tolliver's statement regarding the yield curve is *most likely*:

- A. correct.
- B. incorrect with regard to fiscal policy.
- C. incorrect with regard to monetary policy.

### Questions 31 to 36 relate to Fixed Income Portfolio Management

#### Franconia Notch Case Scenario

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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; therefore, 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 he 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 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 (ALM) 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 1 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 will 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, currently our macroeconomic team 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.”

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31. 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.
32. Which of Whitney’s Statements with regard to implementing its market and interest rate views is *least likely* correct?
- A. Statement 1
  - B. Statement 2
  - C. Statement 3
33. Which of the following statements regarding Whitney’s recommendations for Norris’ three clients is *most likely* correct?
- A. Client 1 will achieve the guaranteed value only if the term structure of interest rates is downward sloping.
  - B. Client 2 will meet the necessary conditions for a multiple-liability immunization in the case of a non-parallel rate shift.
  - C. Client 3 will require less money to fund liabilities because a less conservative rate of return can be assumed for short-term balances.
34. Is Whitney’s approach to rebalancing a portfolio using dollar duration *most likely* correct?
- A. Yes.
  - B. No, there is no need to move forward in time
  - C. No, the steps do not provide the amount of cash needed for rebalancing



35. The two risks that Whitney's is *most likely* exposed to given his recommendations on sectors are:

- A. interest rate risk and cap risk.
- B. contingent claim risk and cap risk.
- C. interest rate risk and contingent claim risk.

36. Whitney's secondary trading rationale is *best* described as:

- A. structure trades.
- B. credit-defense trades.
- C. sector-rotation trades.

#### Questions 37 to 48 relate to Risk Management Applications of Derivatives

##### Anna Lehigh Case Scenario

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Anna Lehigh, CFA, is a portfolio manager for Brown and White Capital Management (B&W), a U.S.-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 (USD millions)	Risk Measure
Mountain Hawk, Inc. common stock	20	Beta: 1.30
U.S. large-cap stocks	30	Beta: 0.95
U.S. midcap stocks	10	Beta: 1.20
Eurozone large-cap stocks (unhedged, USD 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
<b>Total</b>	<b>100</b>	

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	3 years	-2.125
B	4 years	-2.875
C	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 USD 100.00. Options strategies are provided in Exhibit 3:

**Exhibit 3**  
**Options Strategies for Mountain Hawk stock (in USD)**

Strategy	Lower Strike	Upper Strike
Straddle	95.00	95.00
Bull spread	105.00	110.00
Bear spread	90.00	100.00

Lehigh tells the committee she believes U.S. large-cap stocks will perform well over the next year. The committee agrees and wants B&W to adjust the beta of the U.S. 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 USD 100,000.

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

**Exhibit 4**  
**Hedging Strategies**

Strategy	Forwards	Futures
1	Sell EUR and buy USD	Buy US stock market
2	Sell EUR and buy USD	Sell European stock market
3	Buy EUR and sell USD	Sell European stock market

Finally, Lehigh discusses B&W's market view that over the next 24 months, midcap stocks will underperform small-cap stocks and interest rates will rise. 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	Midcap index
Swap 2	Midcap index	Small-cap index

Swap 3	Small-cap index	LIBOR
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37. Lehigh's response to Gulen is *most likely* correct when the option is:
- A. in the money.
  - B. at the money.
  - C. out of the money.
38. Based on the data in Exhibit 2, modifying the duration of the fixed income allocation to its target will require an interest rate swap which has notional principal *closest* to:
- A. USD 6,956,000.
  - B. USD 11,030,000.
  - C. USD 18,823,000.
39. If the price of Mountain Hawk stock declines to USD 88.00, which options strategy will *most likely* have the highest value at expiration?
- A. Straddle
  - B. Bull spread
  - C. Bear spread
40. Will Lehigh's purchase of U.S. large-cap futures contracts *most likely* result in the committee's beta objective for the U.S. large-cap investment being attained?
- A. Yes
  - B. No, because the beta will be below the target
  - C. No, because the beta will be above the target
41. Given the committee's view about the sovereign debt crisis, which hedging strategy is *most likely* to result in Packer earning the U.S. risk-free rate of return?
- A. Strategy 1
  - B. Strategy 2
  - C. Strategy 3

42. Which of the following swaps will *most likely* capture the greatest economic benefit based on the committee's 24-month market view?

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

### **Karina Mamani Case Scenario**

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Karina Mamani is a senior partner at Trujillo Partners, an investment advisory firm headquartered in Lima, Peru. Mamani specializes in domestic (Peruvian) markets. Peru's currency is the nuevo sol (PEN). Its major stock exchange is the Bolsa de Valores de Lima (BVL), and the primary index for that market is the Indice General Bolsa de Valores (IGBVL).

One of Mamani's clients, Angel Huanca, anticipates receipt of PEN10,000,000 from debt investments that are maturing in two months. He will invest these proceeds in an IGBVL index fund. He expects the Peruvian stock market to increase dramatically in the next two months and does not want to miss out on the expected gain. He asks Mamani to recommend a way to get exposure to the IGBVL immediately. Mamani recommends a long futures position using a two-month futures contract on the IGBVL, which is priced at 21,800 and has a contract size of PEN 10 times the price. The index has a beta of 0.98, and the futures contract has a beta of 1.05.

Huanca owns a company that produces auto parts, primarily for export to the United States. He tells Mamani he is worried the nuevo sol will strengthen relative to the U.S. dollar and other currencies, making it more difficult for him to compete with firms in the United States and elsewhere. He asks Mamani to help him devise long-term strategies to deal with this risk.

Huanca recently received 3.2 million common stock shares of Urubamba Copper, Ltd. in partial payment for a mining equipment company he sold to Urubamba. The terms of the sale require him to hold this stock for at least 18 months before selling it. Although Huanca believes Urubamba is a well-run company, its share price is closely tied to commodity prices, which he believes might decline. He tells Mamani, "I know I can use options on Urubamba to manage the risk of my concentrated stock position. Either a covered call strategy or a protective put strategy will reduce the volatility of my position and establish a minimum value for it, but the covered call strategy will also enhance my return if Urubamba's price remains stable, and the protective put strategy will not."

Another of Mamani's clients, Arequipa Industries (AI), is about to borrow PEN120 million for two years at a floating rate of 180-day LIBOR (currently 3.25%) plus a fixed spread of 90 basis points with semiannual resets, interest payments based on actual days/360, and repayment of principal at maturity. AI's management is worried that LIBOR might rise over the term of the loan and asks Mamani to recommend strategies to reduce this risk. Mamani suggests a zero-cost collar on 180-day LIBOR with a cap of 4.70% and a floor 2.25%, payment dates matching the loan payments (on 30 June and 31 December, with the first payment on 31 December) and interest based on actual days/360. She

develops various examples of the impact of the collar, including one using the interest rate scenario in Exhibit 1.

**Exhibit 1**  
**180-Day LIBOR Rates**

Date	LIBOR	Days in Period
30 June 2012	2.60%	182
31 December 2012	2.25%	183
30 June 2013	2.00%	183
30 December 2013	2.50%	182

Mamani informs AI's management that, as an alternative, it could enter into an interest rate swap to effectively convert its floating-rate loan to a fixed-rate loan. Mamani states, "You would take a position in a two-year swap with semiannual payments and a notional principal equal to your loan balance. You would pay a fixed rate equal to current two-year LIBOR and receive 180-day LIBOR. [Q5] Mamani further explains, "Entering into the swap would reduce your firm's market value risk and cash flow risk."

43. The number of IGBVL futures contracts needed to establish the position recommended by Mamani for Huanca is *closest to*:

- A. 43.
- B. 46.
- C. 49.

44. The type of exchange rate risk Huanca is concerned about is *most likely*:

- A. economic exposure.
- B. translation exposure.
- C. transaction exposure.

45. Huanca's comment about using options to manage the risk of his Urubamba common stock position is *least likely* correct regarding:

- A. return enhancements.
- B. reduction of volatility.
- C. establishing a minimum value.

46. Using the LIBOR scenario shown in Exhibit 1 and assuming the zero-cost collar is put in place, the effective interest due on AI's loan for the semiannual period ended on 31 December 2013 is *closest to*:

- A. PEN1,365,000.
- B. PEN1,911,000.
- C. PEN2,062,667.

47. Mamani's description of the interest rate swap to be used to convert AI's floating-rate loan to a fixed-rate loan is *least likely* correct regarding the:

- A. notional principal amount.
- B. fixed interest rate to be paid.
- C. floating interest rate to be received.

48. Is Mamani's explanation of the impact of the interest rate swap on AI's risk *most likely* correct?

- A. Yes
- B. No, it is incorrect regarding cash flow risk
- C. No, it is incorrect regarding market value risk

#### Questions 49 to 54 relate to Portfolio Management of Global Bonds

#### Kingsbridge Case Scenario

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London-based Kingsbridge Partners has been selected to manage a GBP150 million global bond portfolio for a pension fund. Jonathan Bixby, CFA, Kingsbridge's portfolio manager, meets with Iain Seymour, CFA, a fixed income analyst at the firm to review the portfolio and its holdings relative to the client's objectives.

The pension fund allows the use of 100% leverage to generate incremental returns. Bixby evaluates the use of leverage in the portfolio using the data in Exhibit 1.

**Exhibit 1**  
**Asset and Liability Data**

	Assets	Liabilities
Portfolio (GBP millions)	300	150
Duration	5.50	1.00
Expected return or cost (%)	4.75	3.95

Bixby's current macro view is that the economy is growing at a rate above the trend rate and, as a result, interest rates are likely to rise. Given his view, he is concerned the duration of the portfolio is

inappropriate and plans to use the futures market to manage its interest rate risk. His new duration target for the asset portfolio is 4.25, and he uses the data in Exhibit 2 to reposition the portfolio.

**Exhibit 2**  
**Futures Market Data**

Futures contract price	GBP100,500
Conversion factor	1.12
Duration of cheapest-to-deliver bond	5.3
Price of cheapest-to-deliver bond	GBP97,750

Seymour tells Bixby, “International interest rates are not perfectly correlated. We can see the impact of a change in U.S. interest rates on our model global bond portfolio. This portfolio contains U.S. and German bonds and is not currently hedged with regard to currency or interest rates. Our analysis shows that the country beta between the United States and Germany is 0.62.” Model global bond portfolio data is provided in Exhibit 3.

**Exhibit 3**  
**Global Bond Model Portfolio**

	Duration	Allocation (%)
U.S. bond issuers	6.6	60
German bond issuers	3.9	40

Bixby asks Seymour whether the model portfolio should be hedged back to its domestic currency, the pound sterling (GBP). Bixby tells him that actively managing currency risk is an expected source of incremental returns for the portfolio and has historically accounted for 25% of Kingsbridge’s alpha relative to the benchmark. Seymour refers to the data in Exhibit 4 to support his current view that currency exposure in the portfolio should be actively managed.

**Exhibit 4**  
**Currency Market Data**

	U.S.	Eurozone	U.K.
Risk free rate – one year	0.25%	1.50%	0.90%
Spot rate (GBP per USD or EUR)	0.6098	0.8929	NA
Forward rate (GBP per USD or EUR)	0.6137	0.8875	NA
Kingsbridge forecast spot rate in one year	0.6173	0.8850	NA

Bixby asks whether this global portfolio would benefit from including emerging market debt securities. Seymour responds that returns can be attractive in emerging markets during certain periods, but risks also abound. He notes the following risks:

- Risk 1: Returns are frequently characterized by significant negative skewness because the potential large downside is not offset by a comparable upside.
- Risk 2: Emerging markets offer less protection from interference by the executive branch than developed countries.
- Risk 3: Emerging market countries have limited access to secondary sources of liquidity.

Finally, Seymour asks Bixby if he plans to purchase mortgaged-backed securities (MBS) in the portfolio. Bixby responds, "Yes; because MBS spreads are cheap relative to historical levels, I can buy MBS, hedge the interest rate risk by shorting Treasuries, and capture the OAS. By matching the dollar duration of the Treasury position with the dollar duration of the mortgage security, I will have a stable hedge."

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49. Based on the data in Exhibit 1, the duration of the equity in the leveraged portfolio is *closest to*:
- A. 4.50.
  - B. 5.00.
  - C. 10.00.
50. Given Bixby's new target duration and the data in Exhibits 1 and 2, the *most* appropriate action using Treasury futures is to sell:
- A. 646 contracts.
  - B. 789 contracts.
  - C. 811 contracts.
51. Based on Seymour's statement regarding international interest rates, as well as the data in Exhibit 3, the impact of a 100-basis-point decline in U.S. interest rates on the model portfolio's value is *closest to*:
- A. 3.41%.
  - B. 4.02%.
  - C. 4.93%.
52. Based on the data in Exhibit 4, the *most likely* action that Kingsbridge would take to actively manage the portfolio's currency exposure in the currency forward markets is to sell:
- A. USD and buy EUR.
  - B. EUR and buy USD.
  - C. USD, sell EUR, and buy GBP.
53. Seymour is *least likely* correct with respect to which risk regarding investing in emerging market debt?



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

54. Will Bixby's strategy to hedge his purchases of MBS *most likely* be effective?

- A. Yes
- B. No, because one security in the transaction amortizes and the other does not
- C. No, because when interest rates decline, the durations of the two securities will change by different amounts

**Questions 55 to 60 relate to Global Investment Performance Standards**

**Bud Walter Case Scenario**

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Bud Walter is the chief investment officer of Wryte Capital Management (WCM). He is meeting with T.M. McGourn, a prospective client, to discuss Wryte's investment performance as presented in Exhibit 1 and subsequent disclosure notes:

**Exhibit 1**  
**Wryte Capital Management**  
**U.S. Large-Cap Equity Composite**

Year	Gross Return %	Benchmark Return %	Internal Dispersion %	Number of Portfolios	Composite Assets (\$m)	Firm Assets (\$m)
2007	15	15	5.2	20	100	175
2008	22	20	6.1	40	200	275
2009	-20	-25	5.7	30	150	200
2010	11	10	5.2	45	225	300
2011	20	20	4.7	50	250	350

Wryte Capital Management (WCM) has prepared this report in compliance with Global Investment Performance Standards (GIPS). The U.S. Large-Cap Equity Composite has been independently verified by a qualified third party to be GIPS compliant. The verification report was issued only for the composite and not for WCM. It states that during 2009, 2010, and 2011, WCM complied with all composite construction requirements for the composite and that WCM policies are designed to calculate and present performance in compliance with GIPS standards.

**Notes:**

1. The firm is defined as an independent investment manager that invests exclusively in U.S. large-cap, U.S. midcap, and U.S. small-cap equity securities for U.S. resident clients. WCM's policy for valuing portfolios and calculating performance is available upon request. WCM's calculation methodology is

to use time-weighted rates of return. Subperiod rates of return are geometrically linked. Cash equivalent instruments are included in rate-of-return calculations. Returns are calculated quarterly or when large external cash flows (as defined by WCM) take place.

2. The U.S. Large-Cap Equity Composite includes all actual fee-paying portfolios. Each portfolio contains positions in large-cap stocks, which are selected by WCM following an extensive independent analysis. Nondiscretionary portfolios are not included in any composite. WCM does not include in any composite its large-cap model portfolio, which is utilized during the investment selection process.
3. The composite benchmark is the S&P 500 Index, which represents the size-weighted returns of the 500 largest (as measured by market capitalization) U.S.-based publicly traded companies.
4. Gross-of-fees returns are presented before investment management fees and custodial fees but after trading expenses. All clients pay an investment management flat fee of 75 basis points on the month-end account value plus a 10-basis-point performance fee whenever the composite return exceeds the benchmark return by 100 basis points.
5. Internal dispersion is the equal-weighted standard deviation of the annual gross returns of the five portfolios included in WCM's Large-Cap Equity Composite.

McGourn asks Walter why he uses standard deviation as the measure of internal dispersion and whether there are better dispersion measures. Walter responds, "Standard deviation has the advantage of comparability across investment firms. Other measures, such as the high/low range and the interquartile range, are skewed by outliers."

Finally, McGourn asks Walter about WCM's policies regarding the valuation of its investments. Walter states that WCM uses a valuation hierarchy based on items 1 through 4 as follows:

Item 1. Observable quoted market prices for similar investments in active markets.

Item 2. Quoted prices for similar investments in markets that are not active.

Item 3. Market-based inputs other than quoted prices that are not observable for the investment.

Item 4. When no quotes or other market inputs are available, we use WCM estimates based on quantitative models and assumptions.

55. Is WCM *most likely* correct in claiming compliance based on the verification report?

- A. Yes
- B. No, because of the level at which verification is claimed
- C. No, because of the timeframe for which verification is claimed

56. WCM's methodology for calculating performance, as disclosed in Note 1, is *least likely* consistent with GIPS standards for:

- A. external cash flows.

- B. geometrically linked returns.
- C. frequency of return calculations.

57. Is WCM *most likely* compliant with GIPS required standards for composite construction as disclosed in Note 2?

- A. Yes
- B. No, because of how the large-cap model portfolio is treated
- C. No, because of how nondiscretionary portfolios are treated

58. With respect to gross-of-fees returns, Note 4 is *least likely* compliant with GIPS required standards in its treatment of:

- A. custodial fees.
- B. performance fees.
- C. trading expenses.

59. With respect to relative merits of internal dispersion measures, Walter is *least likely* correct about:

- A. high/low range.
- B. interquartile range.
- C. standard deviation.

60. Is Walter's response to McGourn's inquiry regarding WCM's valuation hierarchy *most likely* correct?

- A. Yes.
- B. No, item 4 from the valuation hierarchy should be excluded.
- C. No, the valuation hierarchy should be reordered as item 2, item 1, item 3, and item 4.