2018
CFA® EXAM REVIEW

LEVEL III CFA®

MOCK EXAM 1

WILEY

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Level III Mock Exam A
Morning Session: Answers

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Question: 1
Topic: Portfolio Management—Individual
Minutes: 23

Part A

LOS 8i: Prepare and justify an investment policy statement for an individual investor.

Guideline Answer:

The return objective of the Jacksons is to grow their investment portfolio in real terms to meet the tuition fees of the children and their retirement needs in 18 years' time.

Annual Income

Stephan and Lelia's posttax salaries: ($225,000 + $62,000) × (1 – 0.3) = $200,900

This will increase in line with inflation.

Expenses

Annual living expenses of $103,000, expected to increase in line with inflation

Annual saving into the portfolio = $200,900 – $103,000 = $97,900. Note that since both income and expenses are expected to increase with inflation, this annual saving will also increase in line with inflation, and will be constant in *real* terms.

Assets

Current investment portfolio $455,000.

Removing cost of improvements to home of $310,000 leaves a current investment portfolio of $145,000.

Note: Primary residence should not be included in investible assets.

The goal is to grow assets to meet the real tuition payment and retirement needs of $200,000 + $2,000,000 = $2,200,000.

Working in real terms:

N = 18
PV = –145,000
PMT = –97,900
FV = 2,200,000
CPTI/Y = 1.52%

Since all inputs were real and posttax, this is the posttax real required rate of return of the portfolio.

Add inflation to get the posttax nominal required rate of return of the portfolio: 1.52% + 2% = 3.52%.

Hence, pretax nominal required rate of return is approximately 3.52% / (1 – 0.3) = 5.03%.

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Question: 1
Topic: Portfolio Management—Individual
Minutes: 23

Note: The geometric method would be acceptable, i.e., posttax nominal required rate of return of the portfolio = (1.0152 × 1.02) –1 = 3.55%.

Hence, pretax nominal required rate of return = 3.52% / (1 – 0.3) = 5.07%.

Scoring Guide:

2 points for stating the return objective
1 point for correct calculation of annual income
1 point for correct calculation of annual expenses
1 point for correct calculation of annual saving
1 point for correct calculation of investable assets
1 point for correct calculation of investment goal
1 point for correct TVM method
1 point for adjusting from real to nominal returns
1 point for adjusting from posttax to pretax returns

Note: Credit will be given for using the correct method, even if the numbers used are incorrect. For example, a delegate that completes all steps correctly but uses an incorrect number for annual saving will receive 9 points out of 10.

Part B

LOS 8h: Discuss the effects that ability and willingness to take risk have on risk tolerance.

Guideline Answer:

Any two of the following:

The Jackson's joint income easily covers their annual expenses; hence, there are no ongoing liquidity requirements from the portfolio.

The Jacksons have a long time horizon of 18 years, meaning potential losses due to short-term volatility can be recovered over the longer term.

The Jacksons have stable spending habits and do not expect any significant outflows in the future.

The Jacksons have a relatively small mortgage outstanding against their primary residence. The equity in the property could be used to borrow funds if needed due to short-term volatility.

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Question: 1
Topic: Portfolio Management—Individual
Minutes: 23

Lelia could increase household income by seeking reemployment as a higher-paid IT consultant should increased risk lead to losses.

Both Lelia and Stephan could continue to work past the age of 59 should they need to. This increases the ability to take risk in the investment portfolio.

Scoring Guide:

2 points for each correct factor stated (4 points)

Part C

LOS 12k: Discuss how asset allocation policy may be influenced by the risk characteristics of human capital.

Guideline Answer:

Human capital is the present value of future earnings. When considered as an asset of the portfolio of an investor, diversification benefits can be achieved by investing financial capital in assets that have a low correlation with human capital. Since *Stephan* has earnings that are highly correlated with equity markets, there would be diversification benefits from allocating financial assets to fixed income in the investment portfolio.

Scoring Guide:

1 point for correctly specifying Stephan
2 points for adequate justification

Part D

LOS 8h: Discuss the effects that ability and willingness to take risk have on risk tolerance.

Guideline Answer:

Time Horizon

The Jacksons' time horizon was originally long and multistage. The first stage consisted of 18 years to retirement, and the second stage consisted of retirement, which could last 30 years or more.

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Question: 1
Topic: Portfolio Management—Individual
Minutes: 23

The Jacksons' time horizon is still long and multistage; however, the first stage consists of only 8 years to retirement, while the second stage consists of retirement.

The time horizon for the first stage has decreased from being long term (18 years) to medium term (8 years).

Liquidity Needs

The original liquidity needs of the Jacksons consisted of the payment for the house improvements of $310,000. As net savers, the Jacksons had no ongoing liquidity needs from the investment portfolio.

After 10 years, there are no immediate one-off liquidity needs; however, with Stephan reducing his earnings by becoming a schoolteacher, it is likely that posttax earnings may not cover expenses. In this case, the liquidity needs of the portfolio are likely to be higher.

Risk Tolerance

Both shorter time to retirement and higher liquidity needs imply that the Jacksons have a lower ability to take risk, hence a lower risk tolerance.

Scoring Guide:

2 points for describing how time horizon has changed

1 point for stating impact of change in time horizon on risk objective

2 points for describing how liquidity needs have changed

1 point for stating impact of change in liquidity needs on risk objective

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Question: 2
Topic: Portfolio Management—Individual
Minutes: 22

Part A

Exhibit 1

LOS 10c: Determine a family's core capital and excess capital, based on mortality probabilities and Monte Carlo analysis.

Guideline Answer:

The net spending need of the Coopers is ($85,000 – $15,000 – $30,000) = $40,000 per year

For each year, the joint probability that either George or Enid will survive is:

$$p(\text{at least one survives}) = p(\text{George survives}) + p(\text{Enid survives}) - p(\text{George survives})\ p(\text{Enid survives})$$

Hence:

$$p(\text{at least one survives one year}) = 0.9245 + 0.9888 - (0.9245 \times 0.9888) = 0.99915$$
$$p(\text{at least one survives two years}) = 0.8367 + 0.9443 - (0.8367 \times 0.9443) = 0.9909$$

The core capital for the first two years will be the discounted value of the expected spending. The relevant discount rate is the nominal risk-free rate (2% + 2%), since spending is fixed in nominal terms, and the spending is unrelated to market risk.

$$\text{Core capital (first two years)} = \frac{\$40{,}000 \times 0.99915}{1.04} + \frac{\$40{,}000 \times 0.9909}{1.04^2} = \$75{,}075$$

Scoring Guide:

1 point for correctly calculating net spending needs
1 point for correct calculation of probabilities
1 point specifying/using correct discount rate
1 point for correctly calculating present value

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Question: 2
Topic: Portfolio Management—Individual
Minutes: 22

Part B

LOS 10g: Explain the basic structure of a trust and discuss the differences between revocable and irrevocable trusts.

Guideline Answer:

Determine which of the following types of trust structure would be *more likely* to meet the planning needs of Cooper. (Circle one)	**Justify your choices with *two* reasons for each choice.**
Revocable trust versus (irrevocable trust)	Cooper is keen to protect his estate from future claims by his ex-wives. An irrevocable trust generally provides greater asset protection from future claims against Cooper than a revocable trust since assets are no longer deemed to be owned by Cooper. Cooper wishes to benefit from establishing the trust in a favorable tax environment. Under an irrevocable trust, Cooper will no longer be deemed the owner of the assets and the trustee will be responsible for paying taxes. Under a revocable trust structure, Cooper will continue to be deemed the owner of the assets for tax purposes, and hence will not benefit from the favorable tax environment of the trust.
Fixed trust versus (discretionary trust)	Cooper wishes for the assets of the trust to be distributed according in the most tax-efficient manner given the circumstances of the grandchildren at the time. A discretionary trust, which can make distribution decisions in the future depending on the future tax circumstances of the grandchildren, is better able to meet this objective, since a fixed trust's distribution would need to be specified today. Cooper is keen that assets are protected should the grandchildren experience any claims against their assets from future ex-spouses. Under a discretionary trust, the grandchildren will have no legal right to the assets of the trust; hence, the assets are protected from claims against the grandchildren's estate.

Scoring Guide:

1 point each for correct selection of trust structure (2 points)

2 points for each adequate justification (8 points)

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Question: 2
Topic: Portfolio Management—Individual
Minutes: 22

Part C

LOS 10f: Evaluate the after-tax benefits of basic estate planning strategies, including generation skipping, spousal exemptions, valuation discounts, and charitable gifts.

Guideline Answer:

George Cooper does not trust the children, Lelia and Stephan, to provide responsible stewardship of the bequeathed assets. A generation-skipping strategy will ensure the assets can be transferred directly to the grandchildren without Lelia and Stephan being involved.

Cooper wants to transfer his estate in the most tax-efficient manner. A generation-skipping strategy will be subject to gift taxes only once, whereas a strategy that did not skip generations would be transferred twice, thereby incurring gift taxes twice.

The Coopers paying the gift taxes is tax-efficient since paying the tax liability from the donor's taxable estate decreases the size of the taxable estate and hence the ultimate estate tax.

Scoring Guide:

1 point for stating each reason (3 points)
1 point for explaining the reason clearly (3 points)

Part D

LOS 10k: Evaluate a client's tax liability under each of three basic methods (credit, exemption, and deduction) that a country may use to provide relief from double taxation.

Guideline Answer:

Under the exemption method of double taxation relief, the residence country imposes no tax on foreign-source income. Hence, the grandchildren will be subject to source taxes of only 10% on distributions from the trust.

Scoring Guide:

2 points for correct calculation

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Question: 3
Topic: Portfolio Management—Individual/Behavioral
Minutes: 14

Part A

LOS 6c: Identify and evaluate an individual's behavioral biases.

Guideline Answer:

Behavioral bias	**Identify the comment that *best* illustrates *each* of the behavioral biases suspected by Murphy. Justify *each* response with *one* reason. (Circle the comment number from Exhibit 1.)**	**Justify each response with one reason.**
Endowment	1 2 3 (4) circled	Endowment bias occurs when investors value an asset more when they hold it. Lelia could be demonstrating endowment bias through preferring securities with which she is already familiar over new securities not currently in her portfolio.
Mental accounting	1 (2) circled 3 4	Mental accounting occurs when different parts of the portfolio are treated differently. Stephan is engaging in mental accounting when he states that he will take risk with only one part of the portfolio, while the other part is invested in safer assets in order to meet critical goals.
Availability	(1) circled 2 3 4	Availability bias occurs when judgments are affected by how easily an outcome comes to mind. In this case, Stephan is investing in stocks with the most press coverage that are most available to him.

Scoring Guide:

1 point for selecting each correct comment (3 points)

2 points for adequate justification (6 points)

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Question: 3
Topic: Portfolio Management—Individual/Behavioral
Minutes: 14

Part B

LOS 6d: Evaluate how behavioral biases affect investment policy and asset allocation decisions and recommend approaches to mitigate their effects.

Guideline Answer:

Murphy should attempt to moderate Stephan's biases because they are cognitive (availability and mental accounting), not emotional biases, so he can be educated to avoid these biases. Also, because of Murphy's concern that the Jacksons may fail to meet their investment goals, the standard-of-living risk is high. Adapting to his biases could prevent the Jacksons from achieving their investment goals.

Scoring Guide:

1 point for recommending moderation

2 points for each justification (4 points)

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Question: 4
Topic: Portfolio Management—Institutional
Minutes: 19

Part A

LOS 13c: Evaluate pension fund risk tolerance when risk is considered from the perspective of the 1) plan surplus, 2) sponsor financial status and profitability, 3) sponsor and pension fund common risk exposures, 4) plan features, and 5) workforce characteristics.

Guideline Answer:

LPP has less flexibility around early retirement for plan participants. This will increase the duration of plan liabilities and remove the need for unexpected liquidity. This allows the plan to invest in longer-duration assets and take more risk.

The employees of Larette are younger than the average CAC 40 company. This increases the average time to retirement, increasing the time horizon and allowing the plan to invest in longer-duration assets.

LPP has a lower ratio of retired to active lives. This means the plan has relatively fewer participants drawing pensions so the call on liquidity is lower and the plan can take more risk with longer-dated and less liquid assets.

The LPP is fully funded compared to the average fund, which is facing a deficit. Those in deficit are forced to take a more conservative position, as they cannot run the risk of moving further into deficit.

Larette has a lower debt-to-equity ratio, which means that the business is less exposed to financial risk. Thus, it is better positioned to take risk in the pension fund as the lower leverage means it is more likely to be able to contribute to the fund in times of poor business performance. By contrast, a highly geared company is inherently at higher risk of failure so is less likely to be in a position to make top-up payments to the pension fund in times of financial strain.

Note that the higher correlation is not a reason for higher risk tolerance, nor is the higher percentage invested in government bonds.

Scoring Guide:

1 point for stating each factor (4 points)
1 point for explaining why factor impacts on risk tolerance (4 points)

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Question: 4
Topic: Portfolio Management—Institutional
Minutes: 19

Part B

LOS 13b: Discuss investment objectives and constraints for defined benefit plans.

Guideline Answer:

The required return is set by the trustees as 0.5% above the minimum required return. In order to meet liabilities, the fund must grow at the discount rate of 5%. Therefore, the required return is 5% + 0.5% = 5.5%.

The directors' higher desired return is not appropriate, as it is the trustees who are legally responsible for the fund and managing it prudently for the beneficiaries. The Larette directors are looking to minimize the contributions from the company, but this may involve the fund taking too much risk.

Scoring Guide:

1 point for using discount rate

1 point for using 0.5% target of trustees

1 point for combining the above in the correct calculation

Part C

LOS 13d: Prepare an investment policy statement for a defined benefit plan.

Guideline Answer:

Constraint	Formulate the following two constraints for the Larette pension plan (LPP). Support each answer with *two* reasons from the scenario.
Liquidity	LPP has low liquidity requirements: The workforce is relatively young, on average 22 years from retirement. This is lower than the average for CAC 40 companies, and means that the fund is unlikely to be making large benefit payments in the near future. The fund does not have flexible early retirement provisions, reducing the unexpected calls on liquidity that early retirement would cause. The ratio of retired to active lives is high so the fund has less of a proportional outflow due to paying out to retirement members.
Time horizon	LPP has a long single-stage time horizon. The employees are relatively young, with, on average, 22 years to retirement, There is no early retirement provision. The plan is closed to new participants; hence, it only exists as long as the longest living member draws a pension, which is a finite period of time but will be many years.

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Question: 4
Topic: Portfolio Management—Institutional
Minutes: 19

Scoring Guide:

1 point for stating low liquidity needs

1 point for each reason for low liquidity needs (2 points)

1 point for stating time horizon

1 point for each reason for time horizon (2 points)

Part D

LOS 13c: Evaluate pension fund risk tolerance when risk is considered from the perspective of the 1) plan surplus, 2) sponsor financial status and profitability, 3) sponsor and pension fund common risk exposures, 4) plan features, and 5) workforce characteristics.

Guideline Answer:

An increase in the discount rate would reduce the present value of the liabilities, but would not affect the value of the assets. Therefore, it would improve the funded status of the plan. All else being equal, this would give the plan a higher ability to take risk.

Scoring Guide:

1 point for stating funded status will improve

1 point for explaining that higher funded status means higher ability to take risk

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Question: 5
Topic: Portfolio Management—Institutional
Minutes: 13

Part A

LOS 13j: Discuss the factors that determine investment policy for pension funds, foundation endowments, life and non-life insurance companies, and banks.

Guideline Answer:

The leverage-adjusted duration gap is calculated as $D_A - kD_L$,
where
D_A is the duration of assets
D_L is the duration of liabilities
k is the ratio of the market value of liabilities to the market value of assets.

On the asset side, there has been a rotation from long-maturity personal loans and residential mortgages to shorter-maturity commercial loans and mortgages. This will lower the duration of the assets of the bank, D_A.

On the liability side, there has been a rotation from short-maturity demand deposits to longer-maturity time deposits. This will increase the duration of the liabilities of the bank, D_L.

The bank has expanded in size, but the ratio of assets to liabilities has remained fairly constant.

Hence, the leverage-adjusted duration gap will most likely have fallen. This is consistent with the view that interest rates are less likely to keep falling since a lower duration gives less exposure to falling interest rates.

(*Note:* Technically, k should be based on market values rather than book values. Full credit will be given for referencing this point; however, the net result is that the duration gap is still most likely to fall overall.)

Scoring Guide:

1 point for stating duration of assets will fall

1 point for stating duration of liabilities will rise

1 point for stating that the asset/liability ratio has remained constant

1 point for concluding the leverage adjusted duration gap will most likely have fallen

1 point for explaining that this is consistent with interest rate view of the bank

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Question: 5
Topic: Portfolio Management—Institutional
Minutes: 13

Part B

LOS 13j: Discuss the factors that determine investment policy for pension funds, foundation endowments, life and non-life insurance companies, and banks.

Guideline Answer:

Management Comment	Evaluate the effect (higher, lower, unchanged) of *each* of the management comments in Exhibit 2 on the ability to take risk in the bank's securities portfolio. (Circle one)	Briefly justify *each* response with *one* reason.
"We have greatly increased the use of collateralized debt obligations and asset-backed securities in recent years, which has markedly improved our ability to divest loans from the balance sheet."	(Higher) Lower Unchanged	The ability to securitize loans improves the liquidity of the loan book and reduces the need for liquidity from the securities portfolio.
"Due to the interest rate and competitive environments, the opportunities that we are seeing in our loan business will involve making loans to borrowers of lower credit quality in the future."	Higher (Lower) Unchanged	In order that the overall risk levels of the bank remain unchanged, higher credit risk in the loan book needs to be offset with lower credit risk in the securities portfolio.
"Regulatory conditions continue to tighten, with pledging requirements increasing for all depositary institutions."	Higher Lower (Unchanged)	The securities portfolio of the bank is used to hold government securities against the uninsured portion of deposits. An increase in pledging requirements will increase the number of safe assets the securities portfolio needs to hold for regulatory reasons. In order that the overall risk of the securities portfolio remain unchanged, the bank will hold riskier securities outside of the pledged collateral. Overall ability to take risk in the securities portfolio has not changed.

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Question: 5
Topic: Portfolio Management—Institutional
Minutes: 13

Management Comment	**Evaluate the effect (higher, lower, unchanged) of *each* of the management comments in Exhibit 2 on the ability to take risk in the bank's securities portfolio. (Circle one)**	**Briefly justify *each* response with *one* reason.**
"Loan demand has been increasing due to a robust economy, and we expect this trend to continue. Expected returns on new loans exceed returns in the securities portfolio."	Higher (Lower) Unchanged	Higher loan demand will increase the liquidity needs of the securities portfolio, since the securities portfolio is a source of funds to make new loans. This is particularly the case when new loans have higher expected returns than the securities portfolio.

Scoring Guide:

1 point for each correct higher/lower/unchanged effect selection (4 points)

1 point for each adequate justification (4 points)

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Question: 6
Topic: Portfolio Management—Economics
Minutes: 18

Part A

LOS 14c: Demonstrate the application of formal tools for setting capital market expectations, including statistical tools, discounted cash flow models, the risk premium approach, and financial equilibrium models.

Guideline Answer:

Forecast	**Determine which component (income, earnings growth, or repricing) of the Grinold Kroner Model is *most likely* to be affected by *each* forecast.**	**State how the component is *most likely* to change (higher or lower).**	**Briefly justify *each* response with *one* reason.**
"A slowdown in emerging markets is likely to lead to consumer prices remaining subdued and maybe even a period of deflation."	Expected nominal earnings growth return	Higher (Lower)	The nominal earnings growth return component consists of the expected inflation rate plus the expected real total earnings growth rate. With inflation expected to be lower or prices falling in a period of deflation, the expected inflation rate will be lower; hence, the nominal earnings growth return component is likely to be lower.
"Recent turbulence in credit markets has led to companies turning to equity markets to bolster their balance sheets. As this turbulence subsides, we expect the rate of issuance of shares to decrease."	Expected income return	(Higher) Lower	The expected income return consists of the expected dividend yield minus the expected percentage change in shares outstanding. If share issuances are expected to be lower in the future, then the expected change in shares outstanding will be expected to fall. This in turn increases the expected income return component.

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Question: 6
Topic: Portfolio Management—Economics
Minutes: 18

Forecast	Determine which component (income, earnings growth, or repricing) of the Grinold Kroner Model is *most likely* to be affected by *each* forecast.	State how the component is *most likely* to change (higher or lower).	Briefly justify *each* response with *one* reason.
"The central bank will continue to do whatever it takes to support asset prices as we deem this to be a central pillar to market confidence. As such, asset buying programs will be expanded and will be extended for the first time to the equity market, with the open intention of raising stock market prices."	Expected repricing return	(Higher) Lower	The expected repricing return consists of the expected change in price-to-earnings (PE) ratios. Given the explicit aim of the central bank to raise stock prices, this will most likely lead to higher valuations and an increase in PE ratios.

Scoring Guide:

1 point for determining each correct component (3 points)

1 point for stating each correct change (higher/lower) (3 points)

1 point for each adequate justification (3 points)

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Question: 6
Topic: Portfolio Management—Economics
Minutes: 18

Part B

LOS 15a: Explain the terms of the Cobb-Douglas production function and demonstrate how the function can be used to model growth in real output under the assumption of constant returns to scale.

Guideline Answer:

Forecast	Determine whether Alef is correct or incorrect for *each* of his two statements about the Cobb-Douglas production function.	Briefly justify *each* response with *one* reason.
"The Cobb-Douglas function is often assumed to exhibit constant returns to scale. This means that a given increase in capital stock or labor input results in an equal percentage increase in output."	Correct (Incorrect)	The assumption of constant returns to scale means that a given increase in capital stock *and* labor input results in an equal percentage increase in output. It is not true if a single input increases individually due to the decreased marginal returns of increasing an individual input.
"As with most modernizing economies, the divorce rate and number of single-parent households has led to an uptick in household formation and will likely continue to increase. Under the Cobb-Douglas framework, this is likely to increase total national production in the intermediate term."	(Correct) Incorrect	The change in demographic implies an increase in the aggregate labor force as stay-at-home spouses return to the workforce. This implies the labor force will grow at a rate faster than that of the growth rate of the overall population, and total economic production will therefore increase at a higher rate.

Scoring Guide:

1 point for selecting each correct/incorrect appropriately (2 points)

2 points for each adequate justification (4 points)

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Question: 6
Topic: Portfolio Management—Economics
Minutes: 18

Part C

LOS 15g: Judge whether an equity market is under-, fairly, or overvalued using a relative equity valuation model.

Guideline Answer:

The Yardini model assumes that the market is fairly valued when the justified forward earnings yield is equal to current forward earnings yield of the equity market.

The Yardini model calculates the justified forward earnings yield as the long-term corporate bond rate minus the weighted long-term earnings growth rate, which in this case equals $5.46\% - (0.05 \times 8.5\%) = 5.035\%$.

Given that the expected forward earning yield of the market is 7.25%, the market is *undervalued,* as it is yielding more than the justified forward earnings yield.

Scoring Guide:

2 point for correctly calculating the justified forward earnings yield

1 point for stating the market is undervalued

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Question: 7
Topic: Portfolio Management—Risk Management
Minutes: 15

Part A

LOS 27e: Calculate and interpret value at risk (VAR) and explain its role in measuring overall and individual position market risk.

Guideline Answer:

Weekly historic return = 0.028% × 5 = 0.14%

Weekly historic risk = 0.9% × √5 = 2.012%

Using the one-tailed 95% Z score, the weekly historic VaR is
(0.14% – 1.65 × 2.012%) × £750 million = –£23.854 million

Therefore there is a 5% chance of the portfolio losing more than £23.854 million in a one-week period.

Scoring Guide:

1 point for calculating weekly historic return
1 point for calculating weekly historic risk
2 points for correct application of VaR formula

Part B

LOS 27f: Compare the analytical (variance-covariance), historical, and Monte Carlo methods for estimating VAR and discuss the advantages and disadvantages of each.

Guideline Answer:

One drawback is that the calculation relies on historic figures to give a forward-looking forecast of risk. There is no reason to believe that the future will closely mirror the past.

Another issue is that the calculation relies heavily on the assumption of normality in returns. Even though there is no skew, there may be kurtosis (fat tails). This is particularly a concern if recent years have been stable, as the measured volatility will be low; however, the market may experience unpredictable large movements.

Scoring Guide:

1 point for calculating weekly historic return
1 point for calculating weekly historic risk
2 points for correct application of VaR formula

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Question: 7
Topic: Portfolio Management—Risk Management
Minutes: 15

Part C

LOS 27k: Demonstrate the use of exposure limits, marking to market, collateral, netting arrangements, credit standards, and credit derivatives to manage credit risk.

Guideline Answer:

Choose two from:

Choose OTC contracts that will be marked to market.

Use exchange-traded derivatives to benefit from the margin system.

Require collateral to be posted.

Use payment netting.

Employ minimum credit standards.

Scoring Guide:

1 point for each method (2 points)

Part D

LOS 27f: Compare the analytical (variance-covariance), historical, and Monte Carlo methods for estimating VAR and discuss the advantages and disadvantages of each.

Guideline Answer:

Zombub should use the Monte-Carlo method of estimating VaR.

The portfolio contains MBSs. These vary in prices according to many variables and exhibit path dependency as regards interest rates. Therefore, they should be modeled using Monte Carlo to capture the complexity. Historic price movements do not capture the complexity and risk of MBSs.

OR

Bond values do not follow a normal distribution of returns. Duration is used to measure bond risk rather than standard deviation. Therefore, the normal distribution assumption behind variance-covariance would not be appropriate.

OR

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Question: 7
Topic: Portfolio Management—Risk Management
Minutes: 15

Interest rates are the main driver of bond prices. Recent low interest rates imply low volatility. However, it would be more prudent to consider possible future interest rate paths and model the resulting price volatility than to look at the recent past and draw conclusions. Even though the fund manager believes low stable interest rates will continue, Zombub should look forward at possible alternative scenarios.

Scoring Guide:

1 point for suggesting the Monte Carlo method

2 points for each reason (4 points)

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Question: 8
Topic: Asset Allocation
Minutes: 12

Part A

LOS 17m: Recommend and justify an asset allocation using a goals-based approach.

Guideline Answer:

Goal 1:

From the description in Exhibit 1, Goal 1 is a need, and as such is allocated a required probability of success of 95% according to Cote's system.

Using the data in Exhibit 2, the module with the highest annualized minimum expected return for the time horizon of 15 years with required success of 95% is module D with a return of 4.6%.

Present value of $15 million in 15 years' time discounted at this minimum expected return gives an allocation of $\$15{,}000{,}000/(1.046)^{15} = \$7{,}460{,}398$.

Goal 2:

From the description in Exhibit 1, Goal 2 is a desire, and as such is allocated a required probability of success of 75% according to Cote's system.

Using the data in Exhibit 2, the module with the highest annualized minimum expected return for the time horizon of 15 years with required success of 75% is module D with a return of 6.9%.

Present value of $5 million in 15 years' time discounted at this minimum expected return gives an allocation of $\$5{,}000{,}000/(1.069)^{15} = \$1{,}837{,}826$.

Total allocation to module D = $7,460,398 + $1,837,826 = $9,298,224, which represents an allocation of $9,298,224/$20,000,000 = 46%.

Cote has stated that the excess capital in the portfolio not required to meet Goals 1 and 2 should be held in module C.

Hence optimal allocation is:

Module A: 0%
Module B: 0%
Module C: 54%
Module D: 46%

Scoring Guide:

1 point for identifying module D as the optimal module for goal 1

1 point for correctly calculating capital allocated to goal 1

1 point for identifying module D as the optimal module for goal 2

1 point for correctly calculating capital allocated to goal 2

2 points for correctly specifying overall portfolio module allocation

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Question: 8
Topic: Asset Allocation
Minutes: 12

Part B

LOS 17a: Describe and critique the use of mean–variance optimization in asset allocation.

Guideline Answer:

Any two of the following would be acceptable:

- MVO output asset allocations are highly sensitive to small changes in the inputs.
- MVO asset allocations tend to be highly concentrated.
- Many investors have concerns outside those of simply mean and variance, which are ignored by MVO.
- Although asset allocations may appear diversified across assets, the source of risk may not be diversified.
- MVO is an asset-only approach and does not consider the nature of any potential liabilities.
- MVO is a single-period framework that does not account for trading/rebalancing issues.

Scoring Guide:

1 point for each criticism (2 points)

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Question: 8
Topic: Asset Allocation
Minutes: 12

Part C

LOS 17n: Describe and critique heuristic and other approaches to asset allocation.

Guideline Answer:

Statement	**Determine whether Cote is correct or incorrect for *each* of his two statements about risk-parity-based asset allocation.** (**Circle one**.)	**If the statement is deemed incorrect, briefly justify *why* the comment is incorrect.**
Statement 1: "A risk-parity asset allocation is based on the idea that each asset class should contribute equally to the total risk of a portfolio to be well diversified. As such, optimal weights are determined to be those weights that set the marginal contribution to risk of each asset class in the portfolio to be the same."	Incorrect	Optimal weights under a risk-parity allocation would set the *absolute* contribution to risk of each asset class in the portfolio to be the same, not the marginal contribution to risk.
Statement 2: "Risk-parity portfolios tend to give higher weights to lower-risk assets than portfolios derived from traditional MVO techniques."	Correct	

Scoring Guide:

1 point for selecting "Incorrect" for Statement 1

1 point for adequate justification of Statement 1 being incorrect

2 points for selecting "Correct" for Statement 2

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Question: 9
Topic: Fixed Income
Minutes: 12

Part A

LOS 23c: Formulate a portfolio positioning strategy given forward interest rates and an interest rate view.

Guideline Answer:

Guidwife should select Portfolio C.

Guidwife's view is that the UK yield curve will steepen and become less curved.

Under both of these types of yield curve changes, a bullet portfolio will outperform a barbell portfolio since the bullet portfolio will have lower exposure to long-term rates, which will relatively increase under both a steepening and a falling of curvature.

Guidwife should therefore pick the portfolio with the highest exposure to mid-maturity rates and the lowest exposure to long- and short-term rates. The key rate durations displayed in Exhibit 1 show this to be Portfolio C.

Scoring Guide:

1 point for identifying that a bullet portfolio will outperform under the forecasted yield curve change
1 point for explaining why a bullet portfolio will outperform under the forecasted yield curve change
1 point for identifying Portfolio C as the best portfolio

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Question: 9
Topic: Fixed Income
Minutes: 12

Part B

LOS 23c: Formulate a portfolio positioning strategy given forward interest rates and an interest rate view.

LOS 23e: Evaluate a portfolio's sensitivity to a change in curve slope using key rate durations of the portfolio and its benchmark.

Guideline Answer:

Since shorter-term rates have risen and longer-term rates have fallen, the yield curve has flattened. There has also been an increase in curvature since the average move in short- and long-term rates is negative compared to movements in mid-maturity rates.

Given a flattening of the yield curve and an increase in curvature, a barbell portfolio would outperform due to having more exposure to the relatively lower long-term rates. The most barbelled portfolio is Portfolio B since Exhibit 1 shows this portfolio has the highest exposure to short- and long-term rates; hence Guidwife was incorrect in picking Portfolio A.

Scoring Guide:

1 point for stating that the curve has flattened

1 point for stating that the curve has increased in curvature

1 point for stating a barbell portfolio would be preferred under this yield curve change

1 point for stating that Portfolio A was the incorrect choice, and that Portfolio B would have been a more appropriate choice.

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Question: 9
Topic: Fixed Income
Minutes: 12

Part C

LOS 23e: Evaluate a portfolio's sensitivity to a change in curve slope using key rate durations of the portfolio and its benchmark.

Guideline Answer:

The predicted change using partial PVBPs is given by:

Predicted change = Portfolio par amount × Partial PVBP × (–Curve shift)

The portfolio par amount is £99 million.

The partial PVBP for Portfolio A at the 10-year maturity is given in Exhibit 1 as 0.0157. (*Tutor's note:* Note that this is the GBP impact of a 1 basis point move in the 10-year rate on £100 par of the overall portfolio. This is why the par amount of the portfolio needs to be divided by £100 when we apply the PVBP in the following equation.)

The shift in rates at the 10-year maturity is +5 bps.

Hence predicted change = (£99,000,000/£100) × £0.0157 × (–5) = –£77,715.

Scoring Guide:

1 point for stating the correct formula

1 point for correctly specifying inputs to use in the formula

1 point for applying the formula to inputs correctly

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Question: 9
Topic: Fixed Income
Minutes: 12

Part D

LOS 23e: Evaluate a portfolio's sensitivity to a change in curve slope using key rate durations of the portfolio and its benchmark.

To profit from a curve that is steepening and becoming less curved, Guidwife should create a butterfly portfolio through going long a bullet portfolio and short a barbell portfolio. This would involve buying Portfolio C and shorting Portfolio B.

Scoring Guide:

1 point for stating the correct butterfly positions

1 point for correctly specifying positions in portfolios

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Question: 10
Topic: Portfolio Management—Equity
Minutes: 16

Part A

LOS 25i: Compare techniques for identifying investment styles and characterize the style of an investor when given a description of the investor's security selection method, details on the investor's security holdings, or the results of a returns-based style analysis.

Guideline Answer:

The independent variables for a returns-based style analysis should be mutually exclusive, exhaustive, and represent distinct source of risk.

The indices are mutually exclusive since no stock would be classified as both large cap and small cap, and no stock would be classified as both value and growth.

The indices are exhaustive since they cover the full market cap and style range of the U.S. domestic equity market. WAA has not invested outside of domestic U.S. equity markets.

The indices are distinct sources of risk since capitalization size and style will generate different types of investment return.

Scoring Guide:

1 point for each feature (3 points)
1 point for each statement as to how the indexes meet the features (3 points)

Part B

LOS 25i: Compare techniques for identifying investment styles and characterize the style of an investor when given a description of the investor's security selection method, details on the investor's security holdings, or the results of a returns-based style analysis.

Guideline Answer:

The *R*-squared of the fund is 0.91, which means that the proportion of the variation in fund returns coming from active stock selection is 9%. This indicates that there is some active management occurring at the fund; the product is not merely replicating the passive return of stock indices.

The fund has very low exposure to the two small-cap indices, which confirms that the fund is invested in large-cap securities.

The fund has a high exposure of 30% to large-cap growth stocks, which suggests that the manager is not exclusively investing in large-cap value stocks.

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Question: 10
Topic: Portfolio Management—Equity
Minutes: 16

The manager may more appropriately be labeled as an actively managed large-cap market-oriented portfolio with a value bias.

Scoring Guide:

1 point for stating and explaining that the fund is active

1 point for stating and explaining that the fund is large cap

1 point for stating and explaining that the fund is not exclusively growth stocks

1 point for suggesting new label

Part C

LOS 25i: Compare techniques for identifying investment styles and characterize the style of an investor when given a description of the investor's security selection method, details on the investor's security holdings, or the results of a returns-based style analysis.

Guideline Answer:

The rolling style chart in Exhibit 2 demonstrates that the exposure to large-cap growth has been increasing steadily over time. Laidlaw should inquire with the manager why this style drift has been occurring and whether it is likely to continue.

The plot of *R*-squared over time in Exhibit 3 demonstrates that style fit has been increasing over time, suggesting that active management has been falling. Laidlaw should ask WAA why this is happening and whether this is likely to continue.

Scoring Guide:

2 points for each question (4 points)

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Question: 10
Topic: Portfolio Management—Equity
Minutes: 16

Part D

LOS 25i: Compare techniques for identifying investment styles and characterize the style of an investor when given a description of the investor's security selection method, details on the investor's security holdings, or the results of a returns-based style analysis.

Guideline Answer:

Advantages of holdings-based style analysis: Any two of:

The method characterizes each position rather than looking only at the portfolio as a whole.

The method facilitates the comparison of individual positions.

The method is likely to capture changes in style more quickly.

Scoring Guide:

1 point for each advantage (2 points)

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Question: 11
Topic: Portfolio Management—Monitor/Rebalance/Execution
Minutes: 16

Part A

LOS 32j: Judge the appropriateness of constant mix, buy-and-hold, and CPPI rebalancing strategies when given an investor's risk tolerance and asset return expectations.

Guideline Answer:

Buy-and-hold should be recommended.

Markets are expected to be flat and volatile, ruling out a CPPI strategy.

Ibrahim's risk tolerance increases with wealth more than a constant mix strategy since a constant mix strategy has risk tolerance that increases proportionately with wealth.

A buy-and-hold strategy will provide a floor equal to the initial balance held in cash.

Scoring Guide:

1 point for stating that flat and volatile markets rules out CPPI strategy
1 point for acknowledging how risk tolerance rules out constant mix
1 point for stating buy-and-hold strategy has a floor
1 point for recommending a buy-and-hold strategy

Part B

LOS 32e: Contrast calendar rebalancing to percent-of-portfolio rebalancing.

Guideline Answer:

The weight in domestic equity will be the same under the calendar method as the percent-of-portfolio method.

The calendar method would automatically rebalance domestic equity to the target weight of 35%.

The percent-of-portfolio method would also rebalance all asset classes to target weights on December 31 because the International Equity asset class lies outside its corridor of 25% +/– 3.75%.

Scoring Guide:

1 point for explaining the calendar methodology
1 point for explaining the percent-of-portfolio methodology
2 points for stating the weights will be the same under both methods

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Question: 11
Topic: Portfolio Management—Monitor/Rebalance/Execution
Minutes: 16

Part C

LOS 32f: Discuss the key determinants of the optimal corridor width of an asset class in a percent-of-portfolio rebalancing program.

Guideline Answer:

Factor	State whether an increase in the factor will lead to the optimal corridor width being wider, narrower, or unchanged. (Circle one).	Explain your answer.
The correlation of domestic equity versus other asset classes	(Wider) Narrower Unchanged	A higher correlation of domestic equity versus other asset classes means that weights in the portfolio will be more stable as asset classes move together. This reduces the chance that weights could diverge quickly from target weights and jeopardize the goals of the investor. This lowers the benefit of rebalancing, which means corridor widths need to be wider in order that the benefits of rebalancing outweigh the costs.
The volatility of other asset classes	Wider (Narrower) Unchanged	An increase in the volatility of other asset classes will cause an increase in the volatility of the weight of domestic equity in the portfolio. This means there will be a high chance of a large divergence from target weights; hence, the benefits of rebalancing are high and the corridor widths should be narrow.
The risk tolerance of the investor	(Wider) Narrower Unchanged	Higher risk tolerance means the investor will be comfortable with larger divergences in weights away from the target weights; hence, corridor widths will be wider.

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Question: 11
Topic: Portfolio Management—Monitor/Rebalance/Execution
Minutes: 16

Factor	State whether an increase in the factor will lead to the optimal corridor width being wider, narrower, or unchanged. (Circle one).	Explain your answer.
The volatility of domestic equity	Wider (Narrower) Unchanged	An increase in the volatility of domestic equity will cause an increase in the volatility of the weight of domestic equity in the portfolio. This means there will be a high chance of a large divergence from target weights; hence, the benefits of rebalancing are high and the corridor widths should be narrow.

Scoring Guide:

1 point for each correct wider/narrower/unchanged selection (4 points)

1 point for each justification (4 points)

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Level III Mock Exam A
Afternoon Session: Answers

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Global Investment Performance Standards (GIPS®)

Question 1

Use the following information to answer the next six questions.

UpperQ Investments Attiengesellschaft is an investment management company that claims compliance with the Global Investment Performance Standards (GIPS®). The most recent performance presentation for the European Hedged Equity Composite is shown in Exhibit 1.

Exhibit 1
UpperQ Investments LLC Hedged Equity Composite (All Returns Expressed in Euros)

Year	Gross Return (%)	HF Equity Hedge Index Return (%)	Internal Dispersion (%)	Number of Portfolios	Composite Assets (€ millions)	Firm Assets (€ millions)
2015	–3.67%	–3.17%	1.3%	12	290	2,336
2014	5.57%	3.69%	2.5%	12	285	1,817
2013	–2.10%	–0.70%	4.4%	12	280	2,173
2012	0.88%	0.18%	4.2%	12	270	1,612
2011	3.10%	0.81%	5.1%	11	265	1,892
2010	4.31%	4.85%	5.8%	10	255	1,446
2009	7.44%	3.29%	5.2%	9	201	1,414
2008	–22.60%	–23.02%	5.0%	11	198	1,359
2007	–0.84%	–0.65%	5.4%	10	250	2,228
2006	–2.50%	–2.30%	2.8%	9	245	2,091

Notes:

1. UpperQ Investments LLC claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with GIPS. UpperQ Investments LLC has been independently verified for the period from April 1, 2003, through December 31, 2011. Verification assesses whether (a) the firm has complied with all the composite construction requirements of GIPS on a firmwide basis and (b) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. The Hedged Equity Composite has been examined for the period from January 1, 2009, through December 31, 2011. The verification and performance examination reports are available on request.
2. UpperQ Investments Attiengesellschaft, a subsidiary of UpperQ Capital AG, is based in Frankfurt, Germany, and manages international private pools of capital typically known as "hedge funds." Founded in March 1999, UpperQ manages a wide range of different hedge fund strategies. A full list of composite descriptions is available on request.
3. The composite was created in May 2007 and is composed of portfolios invested using management's discretionary fundamental stock selection process in international equity markets on both a long and short basis, with a general positive net exposure to equity markets.

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4. The HF Equity Hedge Index returns are provided to represent market returns existing during the time periods shown. Index returns have been taken from published sources and represent the market value weighted average of the performance of hedge funds that voluntarily report into the HF Equity Hedge index. The index is not investable.
5. The internal dispersion is measured by the range (i.e., highest return minus lowest return) of annual returns of those portfolios that are included in the composite for the full year.
6. At December 31, 2015, the three-year annualized ex-post standard deviation of the composite and the benchmark are 12.3% and 13.2%, respectively.
7. Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available on request.

Samantha Eridge, CFA, is a prospective client who has requested more information regarding UpperQ's policy for calculating performance, and the firm has responded with the statement in Exhibit 2.

Exhibit 2
UpperQ Calculation Methodology

> "UpperQ Investments AG calculates each portfolio's time-weighted rate of return on a monthly basis. For periods beginning on or after January 1, 2010, portfolios are valued when large cash flows occur, large being defined as comprising at least 5% of the estimated NAV of the fund at the time of the cash flow. In earlier periods, monthly returns are calculated using the Modified Dietz method. Returns for longer measurement periods are computed by geometrically linking the monthly returns."

Eridge wished to demonstrate to her work colleagues how the different calculations mentioned in Exhibit 2 are performed. She collates some information to perform a simple demonstration of the methods contained in Exhibit 3.

Exhibit 3
Example Performance Calculation Data

March 31 portfolio value	$10,000,000
Contribution on March 12	$500,000
Portfolio value on April 12 (including the $50,000 cash flow)	$10,500,000
April 30 value	$10,000,000

---

1. With respect to the information regarding fees contained in Exhibit 1, the presentation:

   A. complies with GIPS.
   B. fails to comply with GIPS because the Standards require that returns are shown both gross and net of fees.
   C. fails to comply with GIPS because the Standards require a fee schedule to be disclosed in the report.

   Answer: C

   GIPS require a fee schedule to be disclosed in the report. While a firm can choose to show performance either gross or net of fees, the Standards recommend that performance is shown gross.

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2. With respect to the reference to verification contained in the compliance statement in note 1 of Exhibit 1, the presentation:

   A. complies with GIPS.
   B. fails to comply with GIPS because the verification period should include the most recent year of performance.
   C. fails to comply with GIPS because the examination of the composite should include the most recent year of performance.

   Answer: A

   Verification is voluntary and can be for periods of performance that do not include the most recent year of performance. Similarly, performing an analysis of a specific composite during the verification process can be done for periods of performance that do not include the most recent year of performance. The compliance statement is in line with the required disclosure given the situation that applies to UpperQ.

3. UpperQ has included in Exhibit 1 details about the internal dispersion of the portfolios in the composite (comprising the data in the table and note 5) plus details about the external dispersion of composite returns over time (note 6). Are these details compliant with GIPS?

	Internal Dispersion	**External Dispersion**
A.	Compliant	Compliant
B.	Not compliant	Compliant
C.	Compliant	Not compliant

   Answer: C

   The internal dispersion data in the table and description in note 5 complies with the requirements of GIPS. The details in note 6 are not compliant with GIPS since three-year annualized ex-post standard deviation of the composite and the benchmark should be shown every year since 2011.

4. The calculation policy disclosures made in Exhibit 2:

   A. comply with GIPS.
   B. fail to comply with GIPS because firms must revalue portfolios whenever an external cash flow occurs, regardless of the size of the cash flow.
   C. fail to comply with GIPS since GIPS do not define a large cash flow as a cash flow comprising at least 5% of the NAV of the fund at the time of the cash flow.

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Answer: A

The disclosure complies with the requirements of the GIPS standards. It is a recommendation, not a requirement, that firms revalue portfolios whenever an external cash flow occurs. The requirement under GIPS is only to revalue the portfolio when the cash flow is deemed by the firm to be large. The definition of *large* is left to the firm and can relate to an absolute or percentage of the fund value, as is the case here.

5. Using the data in Exhibit 3, the monthly return using the Modified Dietz method is *closest* to:

A. –5.00%.
B. –4.85%.
C. –4.76%.

Answer: B

The Modified Dietz method adjusts for the cash inflow by removing it from the final portfolio value and adding a weighted cash flow to the initial portfolio value. The weight is set by the proportion of the period that the cash flow is in the portfolio.

$$modified\ diet\ zreturn = \frac{V_1 - V_0 - CF}{V_0 + (w \times CF)} = \frac{10{,}000{,}000 - 10{,}000{,}000 - 500{,}000}{10{,}000{,}000 + \left(\left(\frac{18}{30}\right) \times 500{,}000\right)} = \frac{-500{,}000}{10{,}300{,}000} = -4.85\%$$

6. Using the data in Exhibit 3 and current GIPS requirements for return calculations, the monthly return is *closest* to:

A. –5.00%.
B. –4.85%.
C. –4.76%.

Answer: C

GIPS require that returns are calculated on a time-weighted basis, adjusting for large external cash flows. Here, the portfolio has had a return of zero in the first 12 days once the contribution is stripped out of the fund value, and the return after the cash flow is given by (10,000,000 – 10,500,000) / 10,500,000 = –4.76%.

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Question 2

Use the following information to answer the next six questions.

Jack Mann, CFA, has recently been awarded the CFA charter and has secured a new role as a junior portfolio manager at Cavalier Investment Management Ltd (CIM), an institutional investment adviser with a broad base of clients including investment funds, hedge funds, and private client managed accounts.

Before Mann can start his new role, he must sign a contract and complete initial induction and training on key regulatory and compliance issues. As part of the induction process, Mann is required to acknowledge receipt of CIM's compliance manual.

Mann's initial role at CIM is to work alongside Ross Bassett, a senior fund manager who has been employed by CIM for several years. Mann notes that Bassett openly discusses holding securities for his personal account that are included in client portfolios. Mann questions Bassett as to the ethical nature of this situation, suggesting that this arrangement might lead to accusations of a conflict of interest from clients. Bassett refers Mann to the compliance manual of CIM, in particular to the extract shown in Exhibit 1.

Exhibit 1
Extract from CIM Compliance Manual Regarding Personal Account Dealing

> "CIM has a strict policy on personal account dealing transaction reporting which requires that employees must disclose holdings in which the employee has a beneficial interest upon commencement of the employment relationship and afterwards on an annual basis. All trades for personal accounts need to be precleared with compliance and duplicate trade confirmations logged with the firm on a monthly basis. Client concerns regarding personal account dealing conflicts of interest are addressed through the following disclosure that must be made to all clients:
>
> 'CIM investment managers are subject to strict policies and procedures regarding their personal trading.'"

Mann notices that Bassett regularly receives offers of gifts from brokers and clients of CIM. In particular, Mann notes the following arrangements that Bassett has recently agreed to in the first few weeks of working with him:

- Alberto Lyons, a sales trader with Roundhead Securities, a broker used by CIM, arranges and pays for lunch with Bassett. Bassett does not disclose this to his employer.
- Roundhead Securities organizes an investor conference in California and pays for the travel expenses, accommodations, and several rounds of golf for the participants. This offer is not unique to Bassett and he discloses it to his employer.
- A client offers Bassett the use of their private ski chalet for a ski season if their portfolio outperforms the benchmark index by more than 10% in any given year. Bassett discloses this arrangement to his employer.

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Mann attends a presentation to a prospective client where Bassett presents information about the investment process at CIM along with a summary of past performance. Bassett is concerned that some of the information presented in the performance might be a misrepresentation of the performance of CIM funds. In particular, Mann notes the following issues:

- While there was no benchmark provided in the presentation, the reason for this disclosed in the report was the complexity and diversity of the strategies followed.
- Several of the calculations and data inputs of the performance presentation were not compliant with the CFA Institute Global Investment Performance Standards (GIPS®).
- A typographical error was noticed in the calculation of performance statistics, which Bassett promises to correct prior to the next time the presentation material is used.

Mann is charged mainly with administrative tasks in his day-to-day role, including the processing of proxy voting forms. Bassett informs Mann that there is no official policy on voting proxies at CIM, and that he only considers in detail votes on nonroutine matters such as a takeover approaches and changes in the structure of the company.

Mann notices that the marketing department of CIM has slightly altered the biography that he provided them before it was published on the website of the firm. The letters "CFA" after his name have been given a slightly larger font than his name, and the biography now explicitly states that Mann passed all three levels of the CFA program at the first attempt (which is factually correct).

Mann becomes aware of a soft-dollar arrangement that exists between CIM and Roundhead Securities. Under the agreement, Roundhead offers execution-only services under a direct market access (DMA) computer-driven system. Bassett has always been satisfied with the execution services of Roundhead and considers the fees to be very competitive when compared to the fees charged by other brokers. When asked what the soft-dollar commissions are used to pay for, Bassett replies that they are always used to benefit the client. Mann noticed that the soft-dollar account has been used to purchase research from Roundhead, and occasionally finance the commissions due on reversals of dealing errors on client accounts.

---

7. The extract from the compliance manual regarding personal account dealing rules displayed in Exhibit 1 *most likely*:

   A. complies with recommendations of the Standards.
   B. fails to comply with the recommendations of the Standards since disclosure of personal account holding should be made more frequently than annually.
   C. fails to comply with the recommendations of the Standards since CIM should fully disclose the details of the policy rather than use generic, nonspecific language.

   Answer: C

   Standard VI(B), Priority of Transactions, recommends that, upon request, members and candidates should fully disclose to investors their firm's policies regarding personal investing. The disclosure must provide helpful information to investors; it should not be simply generic nonspecific language as used in the disclosure statement of CIM.

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8. How many of the gifts that Bassett has accepted are in violation of the CFA Standards of Practice?

   A. One.
   B. Two.
   C. Three.

   Answer: B

   Under Standard II(B), Independence and Objectivity, Bassett has the obligation to reject any gifts that could be seen to impair his independence and objectivity. The lunch paid for by Lyons is likely to be considered a modest gift, and hence is not covered by the standard. The travel expenses, accommodations, and golf expenses are not modest and could impair or be seen to impair the objectivity of Bassett when selecting a broker to execute trades; hence, the offer should have been rejected. Gifts from clients are generally allowed as long as they are disclosed to the employer. Should the gift relate to performance, then this would need written consent from CIM under Standard IV(B), Additional Compensation Arrangements. Since Bassett only disclosed the arrangement and did not seek prior permission, this agreement is in breach of the Standards.

9. With regard to the three potential issues Mann has discovered with the performance presentation delivered by Bassett, how many of these issues are likely to breaches of the CFA Institute Standards of Professional Conduct?

   A. Zero.
   B. One.
   C. Two.

   Answer: A

   Under Standard I(C), Misrepresentation, there is no requirement to disclose a benchmark when presenting performance data if the complexity or diversity of the product means that a benchmark does not exist. While it is recommended that firms adhere to the GIPS under Standard III(D), Performance Presentation, there is no requirement to do so. Making an unintentional error in a performance presentation is not a violation of Standard I(C), Misrepresentation, as long as the error is corrected as soon as it is noticed.

10. Considering the information that Bassett discloses to Mann about the proxy voting process at CIM, it is *most likely* that this process:

    A. complies with CFA Institute Standards.
    B. fails to comply with CFA Standards since all proxies should be voted on by managers.
    C. fails to company with CFA Standards since firms should establish a formal proxy voting policy and disclose this to clients.

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Answer: C

Under Standard III(A), Loyalty, Prudence and Care, managers are expected to conduct a cost-benefit analysis of voting proxies and always vote when the act is expected to generate value for the client. Managers are not expected to vote on every proxy, but should give due care an attention to nonroutine matters.

11. Which of the adjustments to Mann's biography made by the marketing department are likely to be in violation of the Standards?

	Font Size	Reference to Success in Successive Years
A.	Violation	Violation
B.	Violation	Not a violation
C.	Not a violation	Not a violation

Answer: B

Under Standard VII(B), Reference to CFA Institute, the CFA Designation, and the CFA Program, the letters "CFA" should not be given more prominence in any marketing material than the individual's name. Stating the fact that a delegate passed all three levels at the first attempt is not a violation of the Standards, so long as this is not used to imply superior performance or ability.

12. The soft-dollar arrangement described by Bassett is *most likely* a violation of the CFA Institute Standards because:

A. soft-dollar agreements are prohibited under the Standards.
B. soft-dollar agreements cannot be used for electronic direct market access (DMA) execution services.
C. soft dollars should not be being used to pay for the commissions due on trades to reverse errors.

Answer: C

Under Standard III(A), Loyalty, Prudence and Care, soft-dollar agreements are allowed provided they are used to exclusively purchase services that aid the manager in the management of client portfolios. The covering of commissions on deals made to rectify errors should be met by CIM and not taken from the soft-dollar account since this effectively means the client suffers the cost of correcting the trade.

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Question 3

Use the following information to answer the next six questions.

Epic Advisers Ltd ("Epic") is an institutional investment adviser responsible for the management of several large multistrategy hedge funds. While the funds are registered offshore, Epic is located in the United States and as such is a registered Investment Adviser and subject to relevant law and regulations.

Two years ago one of Epic's flagship funds, run by manager Barry Wolf lost two-thirds of its value in a matter of a few weeks and was subsequently liquidated having failed to meet the margin calls of its prime broker. After some senior management changes, the fortunes of the company improved and a review is now being carried out into the policy and process followed by managers at the firm, with a long-term view to adopting the CFA Institute Asset Manager Code of Professional Conduct ("The Code").

Felicity Biggles is an ethics and regulatory consultant that has been hired to carry out the review. She has been tasked with explaining to senior management of the firm how following the requirements of The Code could potentially prevent a similar collapse in future.

Biggles begins her work by looking at an executive review of the reasons why the collapse took place. This review has some key points outlined in Exhibit 1.

Exhibit 1
Executive Summary of Circumstances that Contributed to Fund Collapse

1. The fund was engaging in relative value trades relating to different delivery in commodity futures markets. It would appear that inadequate stress testing failed to contemplate a scenario involving a breakdown in correlations brought about by a natural disaster that triggered the initial losses to the fund.
2. The fund was originally marketed as a convertible arbitrage fund, but over time the manager took larger and larger bets in commodity spread trades. While many investors seemed to be surprised at the strategy shift after the collapse of the fund, the manager had reported annually to investors the shift in strategy by the fund management team as it was taking place.
3. Epic Advisers did not have a compliance department, but did have a senior manager identified as chief compliance officer (CCO). The CCO was aware of the style drift and increase in concentrated risks at the fund and reported these findings to the CEO and board of Epic Advisers.
4. Barry Wolf, the manager of the fund that collapsed, had previously been disciplined by the regulator at a prior employer for not adhering to risk limits imposed on the fund that they were running. While Epic Advisers was aware of this, the investors in the fund were not.
5. Many investors in the fund were not aware of the level of leverage being employed by the fund both implicitly through the use of derivatives and explicitly through borrowed funds.

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Biggles goes on to evaluate the current Code of Ethics employed by Epic. She begins by reviewing two of the firm's compliance procedures, shown in Exhibit 2 below:

Exhibit 2
Epic Advisers Code of Ethics

Risk Management Process:

Managers are directly responsible for understanding and managing the risks inherent in the funds that they run. The company is not deemed to be of a large enough size to warrant a separate risk management function.

Record Keeping:

Records substantiating investment activity, research, policies and procedures, as well as records of any violations and actions taken must be kept in electronic form at least five years, as required by local regulation.

13. With respect to the first issue in the executive summary in Exhibit 1 relating to stress testing, how would adopting The Code address this issue?

A. The Code would not address this issue since there are no specific recommendations relating to stress testing in The Code.
B. The Code addresses the requirement for adequate stress testing under the recommendations for having a reasonable and adequate basis for investment decisions.
C. The Code addresses the requirement for adequate stress testing since it recommends that stress testing be outsourced to a specialist risk management services provider.

Answer: B

Recommendation B4 of The Code relates to having a reasonable and adequate basis for investment decision, and states that managers who engage in complex derivative strategies should understand the various risks and conduct statistical analysis and stress testing to determine how the strategy will perform under different conditions. **Answer A** is incorrect since The Code does address the requirement for stress testing. **Answer C** is incorrect since The Code recommends outsourcing risk management services only when the management firm is too small to have a separate risk management function.

14. With respect to the second issue in the executive summary in Exhibit 1 relating to shift in strategy, how would adopting The Code address this issue?

A. The Code would not address this issue since the manager already adhered to the recommendations of The Code through disclosing to investors the change in investment strategy.
B. The Code would have addressed this issue through prohibiting a change in the strategy of the fund.

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C. The Code would have addressed this issue through requiring that the manager provide information regarding strategy changes well in advance of the changes taking place and giving investors an opportunity to take any actions that they deem necessary in response to the proposed strategy shift.

Answer: C

Recommendation B5b of The Code states that managers should provide details of changes in investment style or strategy well in advance of the changes taking place and allow investors time to react to the proposed changes. Simply disclosing changes as they occur does not meet the recommendations; hence, **Answer A** is incorrect. **Answer B** is incorrect since The Code does not prohibit changes in style.

15. With respect to the third issue in the executive summary in Exhibit 1, did Epic Advisers adhere to The Code in establishing an effective compliance department?

A. Yes.
B. No, since The Code recommends that an entire compliance department should have been established at Epic Advisers.
C. No, since The Code recommends that the CCO should have reported his findings directly to the regulator.

Answer: A

Recommendation D2 of The Code states that effective compliance programs require managers to appoint a compliance officer who is competent, knowledgeable, and empowered to carry out their duty, who reports directly to the CEO or board of directors. There is no recommendation that an entire compliance department should be established, or that the compliance officer should report all findings directly to a regulator.

16. With respect to the fourth issue in the executive summary in Exhibit 1, did Epic Advisers adhere to The Code in handling the prior disciplinary actions against Wolf?

A. Yes.
B. No, since Epic should have disclosed the disciplinary action to investors.
C. No, since Epic should not have hired a manager with a record of disciplinary action by the regulator.

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Answer: B

Recommendation F4b of The Code states that firms should disclose any prior disciplinary action taken by regulators or organizations against managers to investors. There is no recommendation under The Code that managers with disciplinary history should not be hired, although this should be taken into account when hiring managers.

17. With respect to the fifth issue in the executive summary in Exhibit 1 relating to the level of leverage in the failed fund, how would adopting The Code address this issue?

A. The Code prohibits the use of derivatives and leverage.
B. The Code recommends that the use of derivatives and leverage be disclosed to investors.
C. The Code does not address the use of derivatives and leverage in fund strategies.

Answer: B

Recommendation F4c of The Code states that the use of derivatives and leverage should be disclosed to investors.

18. Are the compliance procedures listed in Exhibit 2 in adherence with the recommendations of The Code?

	Risk Management	**Record Keeping**
A.	No	No
B.	Yes	No
C.	No	Yes

Answer: C

Recommendation D7 of The Code states that the risk management function of the firm should be objective, independent, and insulated from the influence of portfolio managers. Firms should consider outsourcing risk management activities if a separate risk management function is not feasible.

Recommendation D4 of The Code states that unless otherwise required by local law or regulations, firms should keep records for at least seven years—in this case there is a requirement to keep records for five years, and that suffices to meet the recommendation of The Code.

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Question 4

Use the following information to answer the next six questions.

John Guscott, CFA, is a risk analyst working for Superb Asset Management (SAM) and has been asked to review the currency exposure and hedging techniques employed by several of the international investment portfolios at the firm. The domestic currency of all of the funds managed by SAM is U.K. Sterling (GBP).

Guscott initially turns his attention to the North American Structured Investment Fund (NASI Fund). This fund has exposure to only two foreign markets, Canada and the United States, details of which are set out in Exhibit 1 (assume that all statistics relate to direct quotations to a U.K. investor):

Exhibit 1
Currency Exposure of the NASI Fund

	Canada	United States
Weight	30%	70%
Foreign asset price volatility	15.2%	17.5%
Exchange rate volatility versus GBP	14.2%	12.8%
Correlation of foreign asset price and exchange rate	0.4	–0.1
Correlation of domestic Canadian returns and domestic U.S. returns	0.8	

During his research, Guscott meets with Chris Brown, the manager of the Global Equity Income and Growth Fund (GEIG Fund). During a discussion with the manager of the fund, Guscott makes the following notes:

"The manager believes that inefficiencies occur in the foreign exchange markets that can be exploited to generate excess return consistently over the long term. One of the major strategies that we have been employing successfully over the past few years is exploiting forward rate bias through the carry trade executed in currency forward markets."

Chris Brown demonstrates a simple carry trade based on USD/GBP where the spot rate is 1.5050 and three-month forward points are –15.

Guscott's next task is to interview the management of the Emerging Markets Opportunity Fund (EMO Fund). Due to the potential for serious currency devaluations in emerging markets, the management team is very strict regarding their currency hedging policy. Despite the high interest rates often seen in emerging-market currencies, the fund always employs a 100% hedge of principal upon entering any foreign asset position and maintain the currency hedge as a static position over the life of the investment. In this way, management hopes to avoid suffering losses due to currency crises that may occur in the emerging markets in which they invest.

The management of the EMO Fund asks Guscott for advice with regards to the lowering the costs of hedging that they are finding excessively high. Guscott investigates options-based strategies that can help

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reduce the cost of enacting currency hedging. They also ask Guscott what is meant by "roll yield" in forward contracts and how this is likely to affect the return of their forward contract hedge positions.

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19. Based on data in Exhibit 1, the expected domestic volatility of the NASI Fund is *closest* to:

A. 13.5%.
B. 18.5%.
C. 20.8%.

Answer: C

The domestic volatility of a foreign currency exposure is calculated as:

$$\sigma^2(R_{DC}) = \sigma^2(R_{FC}) + \sigma^2(R_{FX}) + 2\sigma(R_{FC})\sigma(R_{FX})\rho(R_{FC}, R_{FX})$$

Where

R_{DC} = domestic currency returns
R_{FC} = foreign currency asset returns
R_{FX} = return due to changes in the direct exchange rate

Applying this equation to the Canadian exposure gives:

$$\text{Domestic variance} = 0.152^2 + 0.142^2 + (2 \times 0.152 \times 0.142 \times 0.4) = 0.0605$$

$$\text{Hence, domestic volatility of Canadian exposure} = \sqrt{0.0605} = 0.246 \text{ or } 24.6\%.$$

Applying this equation to the U.S. exposure gives:

$$\text{Domestic variance} = 0.175^2 + 0.128^2 + (2 \times 0.175 \times 0.128 \times -0.1) = 0.0425$$

$$\text{Hence, domestic volatility of Canadian exposure} = \sqrt{0.0425} = 0.206 \text{ or } 20.6\%.$$

Hence, combining the domestic variance of the two exposures using the two-asset portfolio variance formula gives:

$$\text{Portfolio variance} = (0.3)^2(0.0605) + (0.7)^2(0.0425) + 2 \times 0.7 \times 0.3 \times 0.246 \times 0.206 \times 0.8$$
$$= 0.0433 \text{ or } 4.33\%$$

$$\text{Hence, portfolio standard deviation} = \sqrt{0.0433} = 0.208 \text{ or } 20.8\%.$$

20. Based on the information in Exhibit 1, which of the currencies, considered individually, would *most likely* have the highest minimum variance hedge ratio versus GBP (note that calculations are not required)?

A. CAD.
B. USD.
C. Both would have the same minimum variance hedge ratios since both currencies are being hedged against GBP.

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Answer: A

The minimum variance hedge ratio is the slope coefficient of a regression relating the *domestic* returns of a foreign exposure to the exchange rate. This slope coefficient will be higher if the correlation of the exchange rate and the foreign returns are positive, and lower if the correlation is negative. Hence, the currency with the highest minimum variance hedge ratio is likely to be the Canadian dollar.

21. Based on the notes made by Guscott about management of the GEIG Fund, it is *most likely* that the fund is profiting from which of the following parity relations *not* holding?

A. Covered interest rate parity.
B. Uncovered interest rate parity.
C. Purchasing power parity.

Answer: B

Uncovered interest rate parity is a theory that predicts that high interest rate currencies should weaken such that investors get the same returns regardless of the currency their deposits are held in. If this theory held, then the carry trade, which involves depositing in high-interest-rate currencies and borrowing in low-interest-rate currencies, would never work since interest rate differentials would be offset by foreign exchange rate movements. **Answer A** is incorrect since covered interest rate parity is a no-arbitrage law for pricing futures contracts and hence is not used to predict where exchange rates will move to. **Answer C** is incorrect since purchasing power parity predicts that exchange rates are driven by inflation differentials.

22. Given the data presented by Chris Brown, which of the following statements is *most likely* to be accurate in order to carry out a successful carry trade?

A. The manager should go long the forward contract. The trade will be profitable as long as the exchange rate in three months' time is above 1.5035.
B. The manager should go long the forward contract. The trade will be profitable as long as the exchange rate in three months' time is above 1.5035.
C. The manager should go short the forward contract. The trade will be profitable as long as the exchange rate in three months' time is below 1.5035.

Answer: B

In order to execute a carry trade the manager should go long the currency that is at a discount and short the currency that is at a premium in the forward market. Since the forward points are negative, the forward quote is 1.5050 – 0.0015 = 1.5035. The quote being lower means that the base currency (i.e., sterling) is at a discount in the forward market because one pound buys fewer dollars; hence, the manager should buy sterling and sell dollars at 1.5035 in the forward market. This will be achieved by going long the USD/GBP forward contract since this represents an agreement to pay $1.5035 for £1. If the exchange rate quote is higher than $1.5035 in three months' time, then the manager can sell sterling bought under the forward contract for more dollars, hence making a profit.

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23. With regard to Guscott's suggestions to the manager of the EMO Fund on reducing the ongoing costs of hedging, which of the following option portfolios correctly describes a seagull spread?

A. Long a high strike put, short a low strike put.
B. Buying an out-of-the-money put and writing a deeper out-of-the-money put.
C. Buying a protective put, writing a deeper out-of-the-money put, and writing an out-of-the-money call.

Answer: C

Seagull spreads partially fund the purchase of a protective put by writing both out-of-the-money puts and calls.

24. The forward contracts used to hedge positions in the EMO fund are *most likely* to exhibit roll yield that is:

A. negative.
B. positive.
C. dependent on the forward premium/discount in the currency being hedged.

Answer: A

Given the currencies that the EMO fund hedges are high-interest-rate currencies, it is likely that they will be at a forward discount versus sterling (since under covered interest rate parity, the higher-interest-rate currency will be weaker in the forward market). Hence, when the EMO fund hedges, the fund will be selling the currency at a forward discount and buying the currency at a forward premium, which is the opposite of a carry trade. Since the carry trade can be thought of as earning a positive roll yield, in this case where the manager is doing the opposite, they can be considered to be suffering a negative roll yield.

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Question 5

Use the following information to answer the next six questions.

Jethro Mullins is a college graduate who has recently joined the graduate trainee scheme of a large buy-side multi-asset investment manager. The scheme will involve Mullins spending time in all of the major divisions of the firm, the first of which is the fixed-income division.

Mullins initially works alongside Ryusaki Tsurayaki, a bond fund manager who specializes in dedication strategies designed to ensure that portfolios meet the future liabilities of investors. One of the manager's clients is Ali Gug, a high net worth individual who is aiming to meet a personal liability due in 10 years' time, the present value of which is equal to $2,951,100.

The current Gug portfolio consists of three bonds, details of which are displayed in Exhibit 1. Each holding is of size $1 million par value.

Exhibit 1
Gug Fixed-Income Portfolio

Security	Price	Macaulay Duration	Modified Duration
Bond 1	102.36	3.7	3.6
Bond 2	97.61	9.9	9.7
Bond 3	95.14	16.9	16.6

Tsurayaki also runs a portfolio for a client called Haydee Yesenia. This portfolio is engaged in a dedication strategy known as contingent immunization. Details of the strategy are given in Exhibit 2:

Exhibit 2
Yesenia Contingent Immunization Strategy

Current portfolio value	$30 million
Portfolio modified duration	5.5
Liability to be paid in 8 years	$40 million
Effective annual discount rate applied to liabilities	5%

Tsurayaki demonstrates to Mullins how a derivatives overlay could be used to close the current duration gap on the portfolio run for Yesenia. He collates information on a relevant futures contract, which is displayed in Exhibit 3:

Exhibit 3
Futures Contract Information

Notional principal	$100,000
Coupon	6%
Range of maturities of deliverable bonds	8 years to 12 years
Basis point value (BVP) for one futures contract	$76.22

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Mullins is very keen to find out as much as he can about fixed-income investing, and asks Tsurayaki many questions about the different strategies he employs. During the course of the conversation, Tsurayaki makes the following two statements:

Statement 1: "Immunizing a single liability is easy—once you have done it you can sit back and relax. Even if interest rates do change, you can be sure that you will meet your liability when it comes due."

Statement 2: "Duration matching only immunizes against a parallel shift in the yield curve. Any change in the shape of the yield curve would lead to the immunization failing and would cause assets to underperform the liability they are designed to meet."

Tsurayaki explains to Mullins that he expects interest rates to fall in the near future and wants to make a bond trade to profit from this view. Tsurayaki is looking to purchase a 15-year Treasury bond currently priced at 112.01. He expects that in 1 year's time the yield of the bond will have fallen to 2% and he will exit the position. He assumes that reinvestment income will be zero and that the expected price of the bond in 1 year's time if yield curves remain the same will be 111.50. Tsurayaki asks Mullins to decompose the total return expected on the trade.

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25 Based on the data in Exhibit 1, the current money duration of the Gug fixed-income portfolio is *closest* to which of the following?

A. $2,950
B. $295,000
C. $29,500,000

Answer: C

The first thing to do is to calculate the market value of each holding. Given that there is a $1m par value holding in each bond, and that the prices are expressed as a percentage of par the market value of each holding is given as:

Bond 1: (102.36/100) × $1,000,000 = $1,023,600
Bond 2: (97.61/100) × $1,000,000 = $976,100
Bond 3: (95.14/100) × $1,000,000 = $951,400

The money duration of the bonds is given by: market value x modified duration, hence:

Money Duration of Bond 1 = $1,023,600 × 3.7 = $3,787,320
Money Duration of Bond 2 = $976,100 × 9.9 = $9,663,390
Money Duration of Bond 3 = $951,400 × 16.9 = $16,078,660

Hence the Dollar Duration of the portfolio = $3,787,320 + $9,663,390 + $16,078,660 = $29,529,370

26 Is the Gug fixed-income portfolio immunized?

A. Yes
B. No, since the present value of assets is different to the present value of the liability
C. No, since the duration of the portfolio is different to the duration of the liability

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Answer: A

A portfolio is immunized when the present value and the duration of the assets is equal to the present value and duration of the liability respectively.

The present value of the liability is given in the question as $2,951,100
The present value of the portfolio is the sum of the market values of the bond holdings:

Given that there is a $1m par value holding in each bond, and that the prices are expressed as a percentage of par the market value of each holding is given as:

Bond 1: (102.36/100) × $1,000,000 = $1,023,600
Bond 2: (97.61/100) × $1,000,000 = $976,100
Bond 3: (95.14/100) × $1,000,000 = $951,400

Hence the present value of the assets is $1,023,600 + $976,100, + $951,400 = $2,951,100

Hence the present value of assets is equal to the present value of liabilities

The duration of the liability is given in the question as 10 years.

The duration of the assets is calculated as the cash-weighted duration of the bonds in the portfolio. The weights of the bonds in the portfolio are calculated by dividing the market value of the bond by the total value of the portfolio, i.e.

Weight of bond 1 = ($1,023,600/$2,951,100) = 0.3469
Weight of bond 2 = ($976,100/$2,951,100) = 0.3308
Weight of bond 3 = ($951,400/$2,951,100) = 0.3224

Hence the duration of the portfolio is (0.3469 × 3.7) + (0.3308 × 9.9) + (0.3224 × 16.88) = 10.00

Hence the duration of the assets is equal to the duration of the liabilities, and the portfolio is therefore immunized.

27. Based on the data in Exhibit 2, can the portfolio run for Haydee Yesenia engage in active management?

A. Yes, because the surplus is positive.
B. No, because the yield of the portfolio is not high enough.
C. No, because the portfolio value is lower than the present value of the liability.

Answer: A

Active management can be performed when the current market value of assets is greater than the present value of the liability. The present value of the liability of $40m due in 8 years discounted at a rate of 5% is equal to $40,000,000/$(1.05)^8$ = $27,073,574.

Since this is less than the market value of the portfolio, the surplus is positive and active management is therefore possible under a contingent immunization strategy.

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28. The number of futures contracts required to close the duration gap on the Yesenia portfolio is *closest* to which of the following?

A. 0
B. 183
C. 203

Answer: B

The portfolio has a BPV of $\$30{,}000{,}000 \times 5.5 \times 0.0001 = \$16{,}500$

The modified duration of the liability is 8/1.05 = 7.62

The liability has a BPV of $\$40{,}000{,}000 \times 7.62 \times 0.0001 = \$30{,}480$

Hence to close the duration gap (\$30,480 − \$16,500)/\$76.22 = 183.42 contracts, or 183 contracts are required.

29 Are Tsurayaki's statements correct?

	Statement 1	**Statement 2**
A.	Correct	Correct
B.	Correct	Incorrect
C.	Incorrect	Incorrect

Answer: C

Statement 1 is incorrect since immunization is not a passive strategy—rebalancing will be required once interest rates move and due to the passage of time.

Statement 2 is an incorrect statement since a change in the shape of the yield curve could cause the assets to outperform the liability.

30. If Tsurayaki's yield curve forecast is correct, then the actual price of the 15-year Treasury bond in 1 year's time will *most likely* be:

A. lower than \$111.50.
B. equal to \$111.50.
C. greater than \$111.50.

Answer: C

If yields fall then the bond price will rise to be higher than that predicted if yield curves were to remain the same. Hence the bond price will be higher than 111.50 in one-years' time.

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Question 6

Use the following information to answer the next six questions.

Simon Carr is a fixed-income portfolio manager at Proficient LLC, a multi-asset investment advisor. As a fixed income expert, he has been asked to prepare a presentation to the board of Proficient on the sources of return in fixed-income markets. As part of his report he presents the default-risk-free par bonds with different maturities displayed in Exhibit 1:

Exhibit 1
Default-Risk-Free Par Bonds Used in Carr's Report

Security Descriptor			Price in 12 Months with Rolldown of Static Yield Curve	Yield Change Implied by Current Yield Curve over Next 12 Months
Maturity (Years)	**Coupon**	**Current Price**		
1	1.53%	100	100.00	0.73%
2	1.89%	100	100.35	0.77%
3	2.26%	100	100.72	0.70%
4	2.57%	100	100.89	0.49%

Carr intends to use the bonds in Exhibit 1 to demonstrate the performance of a 12-month investment in fixed-income instruments of different maturities given the yield curve scenarios displayed in Exhibit 2:

Exhibit 2
Yield Curve Scenarios Demonstrated by Carr

Scenario A	Yield curve remains static.
Scenario B	Yield curve moves up by a parallel shift of 50 basis points.
Scenario C	Interest rates evolve according to the forward rates implied by the original yield curve.

Carr also intends to use the bonds in Exhibit 1 to demonstrate the active fixed-income strategy of "riding the yield curve." For the purpose of his analysis, he assumes that changes in yield occur at the end of the 12-month holding period.

During his presentation, Carr makes the following two statements:

Statement 1: "When thinking about positioning for parallel shifts in the yield curve, an investor should always remember that there is a direct relationship between the future yield of the bond and the investor's holding period return."

Statement 2: "Another way to profit from a static yield curve is to sell convexity. This can be done by buying bonds with embedded options such as callable and putable bonds."

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31. Based on the data in Exhibit 1, the holding period return for purchasing the 2-year-maturity bond and successfully riding the yield curve for 12 months is *closest* to which of the following?

A. 0.35%
B. 0.77%
C. 2.24%

Answer: C

The strategy of riding the yield curve for 12 months will involve buying the 2-year bond and selling it when it becomes a 1-year bond. If the strategy is successful, the yield curve will remain static and the 2-year bond will roll down a static yield curve and rise to a price of 100.35. A coupon of 1.89 will also be collected hence the total return will be (100.35 + 1.89) / 100 – 1 = 2.24%

32. Based on the data in Exhibit 1, the bond that would give the *highest* return from successfully riding the yield curve for 12 months is the bond with maturity of:

A. 2 years.
B. 3 years.
C. 4 years.

Answer: C

The return to riding the yield curve is higher if the rolldown price is higher and the coupon is higher. This is the case for the bond with maturity of 4 years.

33. Buying the 4-year maturity bond in Exhibit 1 and holding it for 12 months will give a holding period return under scenario C in Exhibit 2 that will *most likely* be:

A. lower than 1.53%.
B. equal to 1.53%.
C. higher than 1.53%.

Answer: B

Scenario C implies that future interest rates evolve according to the forward rates implied by the original yield curve. Under this scenario, all bonds give the same returns for the same investment horizon regardless of their maturity. Hence the 4-year bond will earn the 1-year yield of 1.53% over the next 12 months.

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34. Buying the 4-year-maturity bond in Exhibit 1 and holding it for 12 months will give a holding period return under scenario B in Exhibit 2 that will *most likely* be:

A. lower than 1.53%.
B. equal to 1.53%.
C. higher than 1.53%.

Answer: C

The 4-year bond currently yields 2.57%. According to the current yield curve, as the bond becomes a 3-year bond in 12-months' time, the yield should move to a rate of 2.26% + 0.7% = 2.96%. Scenario B expects all yield to move up by 50 basis points. Since this is a smaller yield rise than expected for the three-year maturity, the bond will outperform the 1-year yield of 1.53% (note that yield changes are expected to occur at the end of the 12 month period, hence the expected change in the 3-year yield is relevant here)

35. Statement 1 by Carr is *best* described as:

A. correct.
B. incorrect, since there is an inverse relationship between the future yield of the bond and the investor's holding period return.
C. incorrect, since there no relationship between the future yield of the bond and the investor's holding period return.

Answer: B

The higher the final yield of the bond, the lower the exit price, and the lower the holding period return will be for the investor.

36. Statement 2 by Carr is *best* described as:

A. correct.
B. incorrect, since convexity is sold by selling bonds with embedded options.
C. incorrect, since convexity may be sold by either buying or selling bonds with embedded options, depending on the nature of the embedded option.

Answer: C

Convexity is sold by buying callable bonds and selling putable bonds.

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Question 7

Use the following information to answer the next six questions.

Jimmy Stripes, CFA, is the chief investment officer of an investment management firm that specializes in running both active and passive equity portfolios. Stripes has been asked to present a short talk at an investment conference regarding the issues involved in running an equity portfolio as part of a broader investment portfolio.

Stripes divides his presentation time equally between passive and active equity strategies.

During his presentation on passive equity strategies, he mentions some well-known stock market indices that are often used as benchmarks for equity portfolios and discusses the different methods of weighting equity indices. He concludes with the following comment:

"Although disadvantages do exist to float-weighted methodology of constructing an index, it has become the main method of index providers in markets today due to the lower portfolio turnover and better representation of the manner in which equity portfolios are actually constructed. One drawback of the float weighting method however is that it is likely to overrepresent the liquidity of smaller companies in the index."

With regard to passive equity investment, Stripes presents a short segment on the relative merits of the approaches of full replication, stratified sampling, and optimization. He gives as an example of a hypothetical client who wishes minimize tracking error against the CAC 40 index in France.

In his segment on active equity management, Stripes chooses to focus on the merits of long/short investing. After the presentation, he is approached by Amir Butt, a long-only fund manager who is interested in expanding the scope of their investment offerings to include short-selling equities.

Butt has many questions for Stripes, listed below:

Question 1: "I have heard there are many arguments for pricing inefficiencies being more abundant on the short side of the market. Examples I have heard mentioned relate to buy-side investors, sell-side analysts, and management of companies themselves."

Question 2: "I am interested in the concept of alpha and beta separation. For example, if I have located a superior small-cap manager and I want to port the manager's alpha onto a large-cap systematic exposure, how might I go about doing this?"

Question 3: "I have heard that short-selling allows managers to avoid the constraints of long-only investing. I'm not sure why this would be the case, since the long-only manager can take a negative view on a stock by not holding it when it is part of the fund's benchmark. Can't they?"

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Stripes enjoys his time at the conference and listens to many other speakers while he is there. He was very impressed by a presentation given that addressed socially responsible investing (SRI), but is concerned about style biases that may be introduced into portfolios by focusing on environment-related negative screening.

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37. With respect to Stripes's comment at the conference on index weighting methodologies, the comment is:

    A. correct.
    B. incorrect, since float-weighted indices tend to have higher portfolio turnover than other index weighting methods.
    C. incorrect, since overweighting of smaller companies is not a drawback of the float-adjusted weighting method.

    Answer: **C**

    The float-adjusted weighting method allocates weights to index constituents relating to the market value of outstanding shares that are freely traded (i.e., free-float). This method is likely to lead to the index having lower turnover than the equal weighting method, which will need to periodically rebalance. It is also likely to overweight large, possibly overvalued companies, rather than small, illiquid companies, the overweighting of which is a drawback of the equal-weighted methodology.

38. With regard to the hypothetical client who wishes to minimize tracking error against the CAC 40 index in France, the best indexing method for Stripes to recommend is:

    A. full replication.
    B. stratified sampling.
    C. optimization.

    Answer: A

    For large-capitalization and liquid indices with fewer than 1,000 stocks, full replication is the best indexing method and will likely give the least tracking error.

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39. With respect to question 1 by Butt, how many of the examples given by Butt are likely to be genuine causes of price inefficiency on the short side?

A. One.
B. Two.
C. All three.

Answer: C

All three reasons are genuine reasons for potential inefficiencies on the short side of equity markets. Buy-side investors may be impeded from short-selling, causing them to look more for undervalued stocks than overvalued stocks. Sell-side analysts may be biased toward giving buy recommendations due to the larger client base and investment banking conflicts. Company management may be biased toward overstating profits rather than understating.

40. How should Stripes respond to question 2 of Butt?

A. Long the small-cap manager, short a small-cap future, buy a large-cap future.
B. Long the small-cap manager, buy a small-cap future, short a large-cap future.
C. Short the small-cap manager, buy a small-cap future, short a large-cap future.

Answer: A

Portable alpha is achieved by removing the beta of the manager by shorting futures contracts with the same systematic risk as the manager. The desired systematic risk, which in this case is large-cap equities, can then be added using a relevant futures contract of the investor's choice.

41. With respect to question 3 of Butt, Stripes should *most likely* reply:

A. Short-selling does not remove any constraints to long-only investing; however, it will give access to better opportunities.
B. While long-only managers can express a negative view by not holding a security in the fund's benchmark, they are constrained in their negative view by the size of the holding in the benchmark. Short-sellers do not have this constraint.
C. Short-selling removes the constraint of always having to look for undervalued securities.

Answer: B

Answer A is incorrect since the ability to short-sell removes the constraint described in **Answer B. Answer C** is incorrect since long-only managers can express a negative view on a security, but only by underweighting the security versus their benchmark, and this view is constrained by the weight of the holding in the benchmark.

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42. Environment-related negative screening is *most likely* to lead to funds being overweight which of the following styles?

A. Value and small-cap.
B. Value and large-cap.
C. Growth and small-cap.

Answer: **C**

Negatively screening to remove companies that are polluting the environment is likely to lead to the portfolio not investing in large, established basic industries and energy. This will likely lead to the portfolio being biased toward small-cap and growth styles.

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Question 8

Use the following information to answer the next six questions.

The Baracas Foundation is considering adding alternative assets to what has historically been a portfolio invested entirely in traditional publicly listed equities and bonds.

The investment committee is meeting to decide which of the major types of alternative asset is *most likely* to meet their requirements.

During the meeting, committee members make the following comments:

Comment 1: "We look to real estate primarily to provide diversification and lower the downside risk of the portfolio. It is not a major objective that any allocation to real estate–related products should boost returns of the portfolio."

Comment 2: "Due to the size of the foundation, any allocation to private equity is likely to not be large enough to meet the minimum commitment levels of more than two or three private equity limited partnerships. On this basis the foundation should consider allocating to a private equity fund of funds since the diversification benefits achieved in doing so are likely to outweigh any extra layer of fees in the fund-of-funds structure."

The committee has also concluded that an allocation to commodities would be appropriate for the foundation, given the principal roles commodities are expected to play in an investment portfolio with respect to diversification and inflation hedging. They are looking at adding a position in three potential commodity investments displayed in Exhibit 1:

Exhibit 1
Three Potential Commodity Investment Positions Considered by the Baracas Foundation

Commodity	Investment Type	Investment Price	Commodity Spot Price
Gold	Spot	$1,300	$1,300
Gold	Futures	$1,250	$1,300
Crude Oil Services Company	Equity	$12.31	$61.55

The committee is also considering the performance data of several hedge fund indices, and the performance data of several large hedge funds of various strategies. One of the committee members who has previous experience working in a hedge fund environment cautions the committee about naïve use of this data. Specifically, they state that biases such as survivorship bias, stale price bias, and inclusion bias can significantly inflate hedge fund index returns. They also state the following issues with the Sharpe ratio when applied to hedge fund returns:

1. The ratio can be gamed by extending a short time period to a longer time period.
2. The ratio assumes zero skewness and excess kurtosis in investment returns—often not the case for hedge funds.

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43. With respect to comment 1 made by the investment committee, it is *most likely* that the Foundation should invest in:

A. direct real estate.
B. real estate investment trusts (REITs).
C. both direct real estate and REITs.

Answer: A

Direct real estate is likely to provide lower returns but higher levels of diversification when added to a portfolio of traditional assets.

44. Is comment 2 by the investment committee accurate?

A. Yes.
B. No, since the minimum commitment levels of fund of funds are likely to be just as high as the minimum commitment levels of individual private equity funds.
C. No, since fees of fund of fund structures are usually lower than that of fees for individual private equity funds.

Answer: A

The comment is correct. **Answer B** is incorrect since the point is that a single allocation to a fund-of-funds structure will provide diversification across many individual private equity funds. **Answer C** is incorrect since, while the fees of fund-of-funds structures are usually lower than those of individual funds, they are still an extra layer of fees on top of the fees charged by individual funds.

45. With respect to the decision to allocate to commodities, it is *most likely* this will be suitable for the Baracas Foundation with respect to:

A. both diversification and inflation protection.
B. diversification, but not inflation protection.
C. inflation protection, but not diversification.

Answer: A

The two major roles that commodities are expected to play in an investment portfolio are to provide low correlations with traditional shares and bonds in order to provide diversification, and to protect against unexpected inflation. Both of these roles are appropriate for the Baracas Foundation: The investment committee has already stated that diversification is a priority over return enhancement, and, being a foundation with a long-term objective of making grants to recipients, inflation hedging is important to the foundation in order to avoid a fall in the real value of the portfolio.

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46. How many of the commodity investments displayed in Exhibit 1 are *direct* investments in commodities?

A. One
B. Two
C. Three

Answer: **B**

Both the spot investment in gold and the futures investment in gold would be considered direct investments. An investment in the equity of a company in an oil-related sector would be deemed an indirect investment.

47. Which of the index biases mentioned by the committee member is unlikely to inflate hedge fund index performance?

A. Survivorship bias.
B. Stale price bias.
C. Inclusion bias.

Answer: B

Stale price bias has been shown to not be a significant issue with most hedge fund returns. Even if it were an issue, the bias causes lower volatility rather than higher returns. Both survivorship bias and inclusion bias will lead to index returns being biased upwards.

48. How many of the issues with the Sharpe ratio, when applied to hedge fund returns listed by the committee member, are accurate?

A. Zero.
B. One.
C. Two.

Answer: C

Both issues are genuine problems when applying Sharpe ratios to hedge fund performance.

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Question 9

Use the following information to answer the next six questions.

Dan McCaw, CFA, is an equity portfolio manager who is considering using option strategies to profit from his views on share prices.

He collects the information given in Exhibit 1 for the premia of listed options on shares of Nelovo N.V., a large-cap stock listed in Amsterdam. Shares in Nelovo are currently trading at a price of €25 per share.

Exhibit 1
Option Premia for Nelovo N.V.

		Expiry		
	Call Premia (€)	**Jun**	**Aug**	**Nov**
Strike	30	0.77	1.38	1.85
	25	1.09	3.50	4.25
	20	5.71	7.84	8.36

	Puts	**Expiry**		
		Jun	**Aug**	**Nov**
Strike	30	5.45	5.93	6.21
	25	0.73	2.89	3.26
	20	0.53	0.93	1.23

Due to his expertise, McCaw has been asked by other fund managers at his firm to give a short presentation on delta hedging at the next asset allocation meeting.

49. If McCaw expects a fall in general market volatility, which of the following options strategies could he use to benefit from this?

A. Long straddle
B. Butterfly spread
C. Inverse butterfly spread

Answer: B

A butterfly spread is an inverse volatility strategy that profits when volatility falls. A long straddle is a strategy that profits when volatility rises.

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50. The maximum loss from a bull spread using August puts with strike prices of €30 and €25 is *closest* to:

A. €1.96
B. €2.89
C. €3.04

Answer: A

Bull spreads are constructed by going long low strike options and short the high strike options. In this case, this would involve buying the €25 strike put option for €2.89 and selling the €30 strike put option for €5.93, giving the investor a net credit of €5.93 – €2.89 = $3.04 to enter the position.

As the underlying asset price falls below €30, the investor will suffer losses on the high strike, short put position. The maximum loss will occur at the low strike since at this price protection from the long put will prevent any further losses. Hence, the maximum loss is suffered when the underlying is at €25.

At €25, the long €25 put expires worthless for a loss of €2.89. The profit from the short €30 put position is €5.93 – €5 = €0.93. Hence, the net profit from the spread is –€2.89 + €0.93 = –€1.96.

51. The net cost to enter a box spread using August options with strikes of 20 and 25 is *closest* to:

A. 2.38.
B. 6.30.
C. 8.16.

Answer: B

A box spread is constructed by taking a synthetic long exposure (long call short put) at the low strike and a synthetic short exposure (short call long put) at the high strike.

Using the August €20 and €25 strike options, this will have a net cost of: 7.84 – 0.93 – 3.50 + 2.89 = 6.3.

52. When using shares to delta hedge a long call option position, after a rise in the underlying share price, the hedger will need to rebalance the position by:

A. increasing a short stock position.
B. reducing a long stock position.
C. reducing a short stock position.

Answer: A

As the underlying asset rises, the delta of the call options will expand, meaning the investor has more long exposure through the call options. In order to remain hedged, the investor will need to increase the size of the short stock position in the hedge.

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53. Which of the following statements regarding the role of *gamma* in delta hedging is *most accurate*?

A. Higher gamma option positions will need more frequent rebalancing.
B. A delta-hedged option position will have zero gamma.
C. The gamma of options is always positive.

Answer: **A**

The gamma of an option measures the sensitivity of the option's delta to a move in the underlying asset price. High-gamma options will have more unstable deltas and hence will need more frequent rebalancing. **Answer C** is incorrect since short option positions will have negative gamma (i.e., the delta of the option increases as the underlying asset falls).

54. Which of the following long call options is *most likely* to have an increasing delta as time to expiration decreases?

A. Out-of-the-money.
B. At-the-money.
C. In-the-money.

Answer: C

In-the-money options will have a delta of less than 1 prior to expiry, and converging to a delta of 1 at expiry. Hence, if the underlying asset does not move, the delta will rise as the option approaches expiry. The opposite is true for an out-of-the-money option—that is, the delta will converge to zero and fall over time. An at-the-money option will have converge to +1 or zero, depending on the exact price of the underlying at expiry.

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Question 10

Use the following information to answer the next six questions.

Katherine Kidman is a pension fund adviser who has been asked by the trustees of a pension fund to evaluate the performance of fund managers that the pension fund has or intends to invest in.

She begins by examining the performance of David Jones. David Jones is a U.K. value fund manager who runs a portfolio that produced a return of 6.14% over a one-month period. Over the same period, the market index generated returns of 6.11%.

Based on David's past portfolios, a normal portfolio with typical systematic risk exposures is determined to have generated returns of 5.96% over the period.

Katherine analyzes the performance of Jones' portfolio using a fundamental factor model. Exposures to fundamental factors are represented as standard deviations from mean values as calculated from market capitalization–weighted stocks. Results are displayed in Exhibit 1.

Exhibit 1
Micro Attribution with a Fundamental Factor Model

		Portfolio Exposure	Normal Portfolio Exposure	Active Exposure	Active Impact	Return
Market Index Return						**6.11%**
Normal Portfolio Return						**5.96%**
	Cash timing	1.17	0.00	1.17	0.08	
	Beta timing	1.06	1.00	0.06	0.04	
Total Market Timing						**X**
	Market size	–1.18	–0.91	–0.27	0.10	
	Financial leverage	0.05	0.06	–0.01	0.08	
	Earnings to price	0.09	0.03	0.06	-0.06	
Total Exposure to Fundamental Factors						**X**
	Technology	35.0	32.0	3.0	0.01	
	Energy	25.0	29.0	4.0	0.05	
	Telecommunications	40.0	39.0	1.0	–0.26	
Total Exposure to Economic Sectors						**X**
Unexplained Return Component						**X**
Actual Return of Portfolio						**6.14%**

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Katherine reports to the trustees that Exhibit 1 shows that David has:

- Successfully managed to outperform an unambiguous benchmark
- Showed himself to be a successful fund manager with regard to market timing and exposure to fundamental factors

In her report on David, Katherine suggests that it may be appropriate for the pension fund trustees to also consider a macro attribution approach to evaluating his portfolio's performance.

Katherine next looks at a European fixed-income fund, which is managed by Jürgen Hamman who invests in German corporate bonds. To better understand the performance of the portfolio, Katherine breaks down its total return into the following components:

- Interest rate effect
- Sector/quality effect
- Security selection effect
- Trading activity effect
- Interest rate management effect

Using this breakdown she reports back to the trustees on a number of components of Jürgen's performance. She feels that it will be necessary to explain to the trustees how each effect is measured.

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55. Over the period examined, it is *most accurate* to say that David's investment style:

    A. underperformed the market index by –0.15%.
    B. outperformed the market index by 0.03%.
    C. outperformed the market index by 0.08%.

    Answer: A

    During the month considered value stocks underperformed the market. The amount of the underperformance is the difference between the market index return and the normal portfolio return that indicates David's investment style:

    $5.96\% - 6.11\% = -0.15\%$

56. The unexplained return component for the month considered in Exhibit 1 is *closest* to:

    A. 0.04%.
    B. 0.12%.
    C. 0.14%.

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Answer: C

Total market timing return = 0.08% + 0.04% = 0.12%

Total exposure to fundamental factors = 0.10% + 0.08% – 0.06% = 0.12%

Total exposure to economic sectors = 0.01% + 0.05% – 0.26% = –0.2%

Normal portfolio return + Total market timing return + Total exposure to fundamental factors + Total exposure to economic sectors + Unexplained return component = Actual return of portfolio

5.96% + 0.12% + 0.12% – 0.20% + Unexplained return component = 6.14%

Unexplained return component = 0.14%

57. Katherine's comment that David has successfully managed to outperform an unambiguous benchmark showing him to be a successful fund manager with regard to market timing and exposure to fundamental factors is:

A. correct both with regard to outperformance of an unambiguous benchmark and success in market timing and exposure to fundamental factors.
B. correct with regard to outperformance of an unambiguous benchmark but incorrect regarding David's success in market timing and exposure to fundamental factors.
C. incorrect with regard to outperformance of an unambiguous benchmark but correct regarding David's success in market timing and exposure to fundamental factors.

Answer: C

Micro attribution with a Fundamental Factor Model as shown in Exhibit 1 has ambiguity regarding the benchmark which is based upon exposure to various risk factors. David's exposure to economic factors has underperformed while he has outperformed with regard to both market timing and exposure to fundamental factors.

58. A macro attribution analysis approach would *most likely* be carried out at the level of the:

A. individual investment manager.
B. fund sponsor.
C. investment sector.

Answer: B

Whereas micro attribution is carried out at the level of individual fund managers the macro attribution approach groups together investment managers and is carried out at a fund sponsor level.

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59. When considering the return components of Jürgen's fixed income fund, the return component due to changes in the forward rate would form part of the:

A. interest rate effect.
B. sector/quality effect.
C. security selection effect.

Answer: A

The interest rate effect is made up of the expected return from implied forward rates and the return from unexpected changes in forward rates.

60. The interest rate management effect of the portfolio would be best calculated by subtracting the return of the:

A. portfolio if each security was repriced as if it were default free from the return of the portfolio.
B. entire treasury universe from the return of the portfolio if each security was repriced as if it were default free.
C. entire treasury universe from the return of the portfolio.

Answer: B

Any difference between the returns to a general universe of treasury bonds, and the return of the portfolio when repriced a default free treasury instrument must purely be due to the interest rate bets that the manager took during the period.

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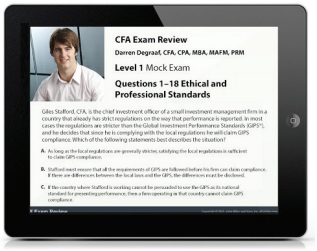

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