Financial Exam Help 123™

2024 Level III Mock Exam

Morning Session Exam #1
Full Guideline Answers

Note to Candidates

In this volume, I have attempted to approximate the style used by CFA Institute in their published guideline answers for the actual morning exams between 1999 and 2018, as well as their explanations in the curriculum. Many of the essay answers here include more information than would likely be necessary for a candidate to write to earn full marks on each question. The answers are intended as both an assessment tool and a learning tool. Please use them accordingly.

Answers appear in red. Supporting commentary (which is not required in the answer, but helps to clarify the answer for the candidate) appears in blue.

The allocation of marks given for each essay answer is my best estimate of the way that CFA Institute's graders will mark actual exam questions, based on scoring that I have seen in their published Level III morning exams and guideline answers between 1999 and 2018. There is no guarantee that this is how CFA Institute's graders will mark exams this year.

If you believe that there is an error in an answer contained here, please consult my errata page to see if your concern has been addressed:

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BCIII

Question 8 relates to Fixed Income Investments

EDPSOE Case Scenario

1.1 The one-year rolldown return on the MBW bonds is *closest to*:

a. 2.17%
b. 3.09%
c. 3.77%

The rolldown return is the return from the change in price over the holding period assuming that the yield curve remains unchanged, and that the spread remains unchanged. The price of one MBW bond today is calculated as:

$$FV = 100,000$$

$$PMT = 7\% \times 100,000 = 7,000$$

$$i = 5.271\% + 4.500\% = 9.771\%$$

$$n = 8$$

$$\text{Solve for } PV = \underline{\underline{-85,092.87}}$$

In one year, it will be a 7-year bond, and its price is calculated as:

$$FV = 100,000$$

$$PMT = 7\% \times 100,000 = 7,000$$

$$i = 5.152\% + 4.500\% = 9.652\%$$

$$n = 7$$

$$\text{Solve for } PV = \underline{\underline{-86,939.68}}$$

The rolldown return is therefore:

$$\text{Rolldown return} = \frac{86,939.68 - 85,092.87}{85,092.87} = \boxed{2.1703\%}$$

The incorrect value of 3.09% results from mistakenly using the projected yield change in one year (4.979% instead of 5.152%). The incorrect value of 3.77% results from mistakenly using the projected spread (4.20%) instead of the existing spread (4.50%).

Reading:

Yield Curve Strategies

LOS: Describe the factors affecting fixed-income portfolio returns due to a change in benchmark yields.

1.2 Of the three internship applicants, the one who seems to know fixed income the best is *most likely*:

a. Mordal
b. Yankov
c. Mkhwanazi

Bond A has a modified duration of about 80% of its maturity, so it is not likely an amortizing bond, which would have a shorter modified duration. Its effective duration equals its modified duration, so it is likely an option-free bond. However, its empirical duration is shorter than its effective (and modified) duration, suggesting that its YTM changes less than the change in the benchmark (i.e., risk-free, government) YTM. This suggests that it trades at a spread over the benchmark – a spread that can change – so it is likely a corporate bond. In summary:

Bond A is most likely a non-amortizing, option-free, corporate bond.

Bond B has a modified duration of about 50% of its maturity, so it is likely to be an amortizing bond: more weight than just the coupon at the shorter maturities, less weight than the coupon plus 100% of par at the longest maturity. Its effective duration equals its modified duration, so it is likely an option-free bond, and its empirical duration equals its effective (and modified) duration, suggesting that it does not trade at a spread over the benchmark, so it is likely a government bond. In summary:

Bond B is most likely an amortizing, option-free, government bond.

Bond C has a modified duration of about 75% of its maturity, so it is likely to be a non-amortizing bond. Its effective duration is significantly shorter than its modified duration, so it likely has embedded options; i.e., it is callable or putable. Its empirical duration equals its effective duration, suggesting that it does not trade at a spread over the benchmark, so it is likely a government bond. In summary:

Bond C is most likely a non-amortizing, callable or putable, government bond.

In short, Mordal nailed it; Yankov and Mkhwanazi, not so much.

Reading:

Overview of Fixed-Income Portfolio Management

LOS: Describe fixed-income portfolio measures of risk and return as well as correlation characteristics.

1.3 Of the points that Beckeles raised in his discussion with Torrilla, it is *most likely* the case that:

a. Point 1 is accurate, but Point 2 is inaccurate
b. Point 1 is inaccurate, but Point 2 is accurate
c. Both Point 1 and Point 2 are accurate

Both of Beckeles' points are accurate.

Not much more to say about that.

Reading:

Fixed-Income Active Management: Credit Strategies

LOS: Discuss liquidity risk in credit markets and how liquidity risk can be managed in a credit portfolio.

1.4 An appropriate transaction for repositioning EGAME's portfolios given Monyake's beliefs is *most likely* to sell:

a. AAA tranches of CDOs and replace them with BBB+ tranches of CLOs
b. BBB+ tranches of ABSs and replace them with AA− tranches of CLOs
c. AAA tranches of CLOs and replace them with BBB− tranches of MBSs

Periods of economic growth are generally accompanied by narrowing credit spreads, particularly in lower-rated bonds. With consumer spending leading the recovery, CLOs backed with shorter-term consumer debt are likely to feel the effect more quickly than MBSs and CDOs backed by longer-term debt. The most appropriate repositioning strategy is to reduce the credit quality of the portfolios while shifting from bonds backed by longer-term (and corporate) debt to bonds backed by shorter-term consumer debt.

Replacing AAA-rated CDOs with BBB+-rated CLOs accomplishes these goals: it reduces the credit quality and shifts from longer-term corporate debt to shorter-term consumer debt.

Replacing BBB+-rated ABSs with AA−-rated CLOs increases the credit quality, rather than reducing it.

Replacing AA-rated CLOs with BBB−-rated MBSs shifts from shorter-term consumer debt to longer-term debt.

Reading:

Fixed-Income Active Management: Credit Strategies

LOS: Describe the use of structured financial instruments as an alternative to corporate bonds in credit portfolios.

Question 2 relates to Global Investment Performance Standards

Málaga Asset Management Case Scenario

2.1 Concerning the benefits to GAM that Díaz listed in his presentation, the number of errors in his list is *closest to*:

a. Zero (0)
b. One (1)
c. Two (2)

All of the benefits to the firm that Díaz claims in his presentation are accurate.

Reading:

Overview of the Global Investment Performance Standards

LOS: Discuss the objectives and scope of the GIPS standards and their benefits to prospective clients and investors, as well as investment managers.

2.2 Does GAM's valuation hierarchy (i.e., the steps in their valuation process) *most likely* comply with GIPS?

a. Yes
b. No, because, although they have all of the correct steps, they're in the wrong order
c. No, because they're missing steps, and they have steps in the wrong order

The valuation steps outlined in GIPS are, in order of precedence:

1. objective, observable, unadjusted quoted market prices for identical investments in active markets on the measurement date. If such inputs are not available or appropriate, then investments should be valued based on:
2. quoted prices for similar investments in active markets. If such inputs are not available or appropriate, then investments should be valued based on:
3. quoted prices for identical or similar investments in markets that are not active (markets in which there are few transactions for the investment, the prices are not current, or price quotations vary substantially over time and/or between market makers). If such inputs are not available or appropriate, then investments should be valued based on:
4. market-based inputs, other than quoted prices, that are observable for the investment. If such inputs are not available or appropriate, then investments should be valued based on:
5. subjective, unobservable inputs.

GAM's hierarchy omits step 2, and reverses the order of steps 3 and 4.

Reading:

Overview of the Global Investment Performance Standards

LOS: Explain the recommended valuation hierarchy of the GIPS standards.

2.3 Of the two methodologies that Díaz described for handling a large deposit with respect to composites, it is *most likely* the case that:

a. Only approach 1 is GIPS compliant
b. Only approach 2 is GIPS compliant
c. Both approaches are GIPS compliant

When significant cash flows occur that may prevent an account from implementing its mandate fully, GIPS allows that either the account may be removed from composites temporarily (until the cash flow can be invested fully, in line with the account's investment mandate), or the firm may use temporary accounts to remove the effect of the cash flow.

Reading:

Overview of the Global Investment Performance Standards

LOS: Explain requirements of the GIPS standards with respect to composite construction, including switching portfolios among composites, the timing of the inclusion of new portfolios in composites, and the timing of the exclusion of terminated portfolios from composites.

2.4 To comply with GIPS composite requirements, GAM should *most likely* adopt:

a. Any of the three approaches considered by Crétinoir
b. Only approach 2 or approach 3
c. Only approach 3

GIPS defines a composite as "*an aggregation of one or more portfolios that are managed according to a similar investment mandate, objective, or strategy.*" Therefore, GAC is free to aggregate all portfolios with the same mandate (approach 1), the same strategy (approach 2), or the same objective (approach 3).

Reading:

Overview of the Global Investment Performance Standards

LOS: Explain the role of investment mandates, objectives, or strategies in the construction of composites.

Question 3 relates to Individual Investors

Hape Brown Case Scenario

3.1 Given Brown's belief, **determine** whether the Decordova-Reids' allocation to fixed income (including cash) is too low, correct, or too high.

The Decordova-Reids' allocation to fixed income is too high.

Justify your determination with *one* reason.

The Decordova-Reids' human capital is bond-like (substantially assured, inflation-adjusted, low risk), so their effective allocation to fixed income is (values in millions):

$$\frac{\text{Fixed income financial capital} + \text{human capital}}{\text{Total financial capital} + \text{human capital}}$$

$$= \frac{(\text{JMD } 40 + \text{JMD } 96 + \text{JMD } 280) + (\text{JMD } 230 + \text{JMD } 389)}{\text{JMD } 800 + (\text{JMD } 230 + \text{JMD } 389)}$$

$$= \underline{\underline{73\%}}$$

Their average age is:

$$\frac{59 + 55}{2} = \underline{\underline{57}}$$

As their effective allocation to fixed income (73%) is substantially greater than their guideline allocation to fixed income (57%, per OYAIB), their allocation to fixed income is too high based on Brown's criterion.

Allocation of marks:

1 mark for writing "Too high"

2 marks for a correct justification

(Note: no marks are earned for justifying an incorrect determination.)

Reading:

Risk Management for Individuals

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

3.2 **Determine** which monetization strategy (outright sale, forward sale contract, total return equity swap) is *most appropriate* for the Cuéllars.

The most appropriate monetization strategy for the Cuéllars is a forward sales contract.

For *each* inappropriate strategy, **identify** *one* reason that it is inappropriate, based *solely* on the information given.

Outright sale

The Cuéllars want to minimize (or, at least, defer) any taxes that they would have to pay. An outright sale will result in substantial capital gains taxes because the tax basis on the shares is quite low (only 17% (= COP 190 billion / COP 1.1 trillion) of the current stock value), so it doesn't meet the Cuéllars' requirements.

Total return equity swap

Because the value of LCES shares can only be estimated (i.e., there are no arms-length transactions from which to observe share prices), there is no reliable basis for determining the total return on the stock, which would be required for a total return equity swap. Therefore, this approach is not available to the Cuéllars.

Note that although the value of LCES shares can only be estimated, a forward sales contract is still possible, although it would require negotiating a price with a potential buyer (much as selling a house requires such a negotiation). This situation is very different from that of a total return equity swap, as that would require an *objective* assessment of the stock's value **on each settlement date**, not merely a **one-time** (and possibly quite *subjective*) assessment today.

Allocation of marks:

1 mark for writing "Equity forward sales contract"

For *each* inappropriate approach:

2 marks for one correct reason

Reading:

Topics in Private Wealth Management

LOS: Describe strategies for managing concentrated positions in privately owned businesses and real estate.

3.3 Using Brown's approach, **determine** which life insurance policy (Calgary Life, Assurance Vie au Québec) is less expensive for Verhoeven.

The life insurance policy with the lower net payment cost index for Verhoeven is Calgary Life.

Justify your determination.

I shall go through the net payment cost index methodology for both policies. However, note that it is not necessary to do so. There is a simple shortcut for Calgary Life, and no calculation is required for Assurance Vie au Québec.

Calgary Life

The future value (in 20 years) of the premium payments is (calculator in BGN mode):

$$PV = \text{CAD } 0 \qquad PMT = \text{CAD } -20{,}500 \qquad n = 20 \qquad i = 5.5\%$$
$$\text{Solve for } FV = \underline{\underline{\text{CAD } 754{,}115}}$$

The future value (in 20 years) of the dividends received is (calculator in END mode):

$$PV = \text{CAD } 0 \qquad PMT = \text{CAD } 5{,}000 \qquad n = 20 \qquad i = 5.5\%$$
$$\text{Solve for } FV = \underline{\underline{\text{CAD } -174{,}342}}$$

The net future value is:

$$\text{CAD } 754{,}115 - \text{CAD } 174{,}342 = \underline{\underline{\text{CAD } 579{,}773}}$$

The annual payment to achieve the net future value (calculator in BGN mode):

$$PV = \text{CAD } 0 \qquad FV = \text{CAD } 579{,}773 \qquad n = 20 \qquad i = 5.5\%$$
$$\text{Solve for } PMT = \underline{\underline{\text{CAD } -15{,}761}}$$

Thus, the net payment cost index for the Calgary Life policy is $\boxed{\text{CAD } 15{,}761}$.

Calgary Life (cont.)

However, because each year has a CAD 20,500 payment at the beginning and a CAD 5,000 dividend at the end (i.e., all years have the same cash flows), the net cost per year (with beginning-of-year payments) is simply the present value of the payment less the present value of the dividend.

The PV of the payment is CAD 20,500 (because it is made at the beginning of the year). The PV of the dividend is that dividend discounted for one year at 5.5% (because it is made at the end of the year):

$$\text{PV}(\text{dividend}) = \frac{\text{CAD } 5,000}{1.055} = \underline{\text{CAD } 4,739}$$

The net payment (the net PV) is:

$$\text{CAD } 20,500 - \text{CAD } 4,739 = \boxed{\text{CAD } 15,761}$$

Assurance Vie au Québec

The future value (in 20 years) of the premium payments is (calculator in BGN mode):

$$PV = \text{CAD } 0 \qquad PMT = \text{CAD } -16,000 \qquad n = 20 \qquad i = 5.5\%$$
$$\text{Solve for } FV = \underline{\text{CAD } 588,577}$$

As there are no dividends, the net future value is:

$$\underline{\text{CAD } 588,577}$$

The annual payment to achieve the net future value (calculator in BGN mode):

$$PV = \text{CAD } 0 \qquad FV = \text{CAD } 588.577 \qquad n = 20 \qquad i = 5.5\%$$
$$\text{Solve for } PMT = \underline{\text{CAD } -16,000}$$

Thus, the net payment cost index for the Assurance Vie au Québec policy is $\boxed{\text{CAD } 16,000}$. This, of course, is the annual payment, because there are no dividends to affect it.

So, the net payment cost index for Calgary Life (CAD 15,563) is less than that of Assurance Vie au Québec (CAD 16,000).

Allocation of marks:

1 mark for writing "Calgary Life"

2 marks for calculating the correct net payment cost index for Calgary Life

1 mark for calculating the correct net payment cost index for Assurance Vie au Québec

Reading:

Risk Management for Individuals

LOS: Describe the basic elements of a life insurance policy and how insurers price a life insurance policy.

Question 4 relates to Equity Investments

Mwanza Management Case Scenario

4.1 Based on the data in Exhibit 1 and Evance's criterion, **identify** the *most appropriate* benchmark index (Index A, Index B, or Index C) for the Endowment's equity portfolio.

The most appropriate benchmark index for the Endowment's equity portfolio is Index B.

Justify your selection.

Evance's criterion for selecting an index is that the effective number of (equal-weighted) stocks should be close to that of the Endowment's portfolio. The effective number of stocks is:

$$\text{Effective number of stocks} = \frac{1}{\text{HHI}}$$

Because the Endowment's portfolio is equal-weighted, its effective number of stocks is 108. The effective numbers of stocks for each of the indices is:

$$\text{Effective number of stocks}_{\text{Index A}} = \frac{1}{0.0133} = 75.3 \text{ stocks}$$

$$\text{Effective number of stocks}_{\text{Index B}} = \frac{1}{0.0096} = 104.7 \text{ stocks}$$

$$\text{Effective number of stocks}_{\text{Index C}} = \frac{1}{0.0044} = 229.7 \text{ stocks}$$

104.7 is closer to 108 than is either 75.3 or 229.7. Therefore, index B meets Evance's criterion.

Allocation of marks:

1 mark for writing "Index B"

2 marks for stating that Index B's effective number of stocks is closest to the portfolio's effective number of stocks

(Note: no marks are earned for justifying an incorrect selection.)

Reading:

Passive Equity Investing

LOS: Discuss considerations in choosing a benchmark for a passively managed equity portfolio.

4.2 **Recommend** the *most appropriate* approach (holdings-based, returns-based, manager self-identification) for Evance to use to determine the historical investing style of the Foundation's equity portfolio.

The most appropriate approach for Evance to use to determine the historical investing style of the Foundation's equity portfolio is a returns-based approach.

Justify your recommendation.

Because Evance has the historical monthly portfolio values as well as the monthly cash flows, she can calculate the portfolio's monthly returns for the last 20 years. She therefore has the data needed to perform a returns-based analysis.

Although Evance knows the portfolio's current holdings, she does not know what the portfolio's historical holdings are, nor does she have any means to get that information. Therefore, a holdings-based approach is not available to her.

Although the portfolio's previous manager agreed to the balanced mid-cap/small-cap and balanced growth/value style required by the IPS, the portfolio's current holdings suggest that he deviated significantly from that mandate. For example, 26% of the portfolio's value is in large-cap stocks and 24% is in small-cap stocks. Similarly, 65% of the value is in growth stocks, with only 35% in value stocks. Therefore, the self-identification appears to be unreliable.

Allocation of marks:

1 mark for writing "Returns-based"

2 marks for an appropriate justification of the returns-based approach

For each approach not recommended:

1 mark for a correct reason that the approach is inappropriate

Reading:

Active Equity Investing: Strategies

LOS: Discuss equity investment style classifications.

4.3 **Calculate** the active return for the Plan's equity portfolio and the active risk for the Plan's equity, net of fees.

Active return for the Plan's equity portfolio, net of fees

A common error on this question is to use 5.8% as the benchmark return: the 5.7% net return on the core (index) portfolio plus the 0.1% management fee (assuming that the trading costs are negligible). While it is true that the index itself had a return of 5.8%, the Plan cannot earn 5.8% *net of fees*: if it followed a pure indexing strategy for its entire portfolio, the return *net of fees* would be 5.7%, not 5.8%. Thus, 5.7% is the correct return against which to compare the *net-of-fees* returns on the satellite portfolios, not 5.8%.

The active return for the core portfolio is zero because it follows a pure indexing strategy. The active return for the overall portfolio is the weighted average of the active returns for all of the sub-portfolios:

$$\text{Active return} = 0.4(0\%) + 0.2(4.6\% - 5.7\%) + 0.2(9.1\% - 5.7\%) + 0.2(5.9\% - 5.7\%)$$

$$= \boxed{0.50\%}$$

Alternatively,

$$\text{Portfolio return} = 0.4(5.7\%) + 0.2(4.6\%) + 0.2(9.1\%) + 0.2(5.9\%) = \underline{\underline{6.2\%}}$$

$$\text{Active return} = \text{Portfolio return} - \text{Benchmark return} = 6.2\% - 5.7\% = \boxed{0.5\%}$$

Active risk for the Plan's equity portfolio, net of fees

Because the correlations of active returns are all zero, the active risk for the portfolio is:

$$\text{Active risk} = \sqrt{\sum_{i=1}^{n} w_i^2 \sigma_i^2}$$

$$= \sqrt{0.4^2(0\%)^2 + 0.2^2(8.5\%)^2 + 0.2^2(12.5\%)^2 + 0.2^2(10.0\%)^2}$$

$$= \boxed{3.6249\%}$$

Allocation of marks:

2 marks for the correct active return (0.50%)

If the answer is incorrect:

1 mark for the correct formula for active return

1 mark for the correct calculation of the active return

2 marks for the correct active risk (3.6249%)

If the answer is incorrect:

1 mark for the correct formula for active risk

1 mark for the correct calculation of the active risk

Reading:

Active Equity Investing: Portfolio Construction

LOS: Discuss risk measures that are incorporated in equity portfolio construction and describe how limits set on these measures affect portfolio construction.

Question 5 relates to Performance Evaluation

Tian Shan Case Scenario

5.1 Visnelda's description of a Sharpe style analysis benchmark is *most likely* accurate with regard to:

a. The allowable coefficient values, but not with regard to it being a returns-based benchmark
b. It being a returns-based benchmark, but not with regard to the allowable coefficient values
c. It being a returns-based benchmark and also with regard to the allowable coefficient values

Visnelda is correct that a Sharpe style analysis benchmark is a returns-based benchmark. Once the indices are chosen, a regression analysis is run (most commonly a least-squares, best fit regression) and the coefficients (sensitivities, slopes, or betas) are used to create a benchmark portfolio of that specific mixture of those indices that best represents the returns on the given portfolio. Going forward, the portfolio's returns are then compared to that benchmark portfolio's returns.

Visnelda is incorrect about the allowable coefficient values. They do have to sum to 1 (one), as she says, but they are generally constrained to being nonnegative (i.e., zero or positive). In essence, they create a long-only portfolio from the chosen indices.

Reading:

Portfolio Performance Evaluation

LOS: Describe types of asset-based benchmarks.

5.2 With regard to his fixed income subportfolio for the Plan, Battistini's misfit active return and true active return, respectively, are *closest to*:

	Misfit Active Return	True Active Return
a.	−25.03%	−13.26%
b.	−25.03%	11.77%
c.	−13.26%	11.77%

The misfit active return is the difference between the return on the submanager's (Battistini's) normal benchmark (here, the Bloomberg Barclays Global Aggregate Bond Index) and the return on the overall portfolio's benchmark (here, the S&P Global 1200):
$-5.76\% - 19.27\% = -25.03\%$

The true active return is the difference between the return on the Battistini's portfolio and the return on the submanager's normal benchmark: $6.01\% - (-5.76\%) = 11.77\%$

The incorrect value of −13.26% is the difference between the return on the Battistini's portfolio and the return on the overall portfolio's benchmark: $6.01\% - 19.27\% = -13.26\%$

Reading:

Portfolio Performance Evaluation

LOS: Describe the impact of benchmark misspecification on attribution and appraisal analysis.

5.3 In formulating a performance attribution analysis for the Plan's commodities sub-portfolio, is it *likely* that TSIB will have a "residual" plug figure to reconcile the total return?

a. No
b. Yes, because the analysis is holdings-based
c. Yes, because the analysis is transactions-based

The Plan's commodities sub-portfolio occasionally holds positions for only a few hours, which suggests that Bandé, the portfolio manager, may purchase an investment one day and sell it later that day. As the performance evaluation is based only on end-of-day holdings, it would not account for such intra-day transactions and would, therefore, miss the return attributable to them. Therefore, when reconciling the performance based on end-of-day holdings with the total return earned in a period, there will likely be a discrepancy. TSIB will have to reconcile that discrepancy with a plug figure labeled "residual" or "miscellaneous" or something similar.

Note that with an accurate, complete, transactions-based analysis, a reconciling plug figure would not be necessary, as the analysis would already include the returns attributable to intra-day transactions.

Reading:

Portfolio Performance Evaluation

LOS: Describe returns-based, holdings-based, and transactions-based performance attribution, including advantages and disadvantages of each.

5.4 Based on the information given, is it *most likely* accurate to conclude that Bandé's portfolio outperformed the index?

a. Yes
b. No, because Bandé's portfolio was not fully collateralized
c. No, because Bandé's portfolio held both physical commodities and commodities futures

Performance attribution comprises both return attribution and risk attribution. The information given tells us that Bandé's portfolio's return was 257 bps greater than that of the index, but gives us only a vague sense of the differences in risk between his portfolio and the index: his portfolio used leverage to some (unknown) degree (levered positions in physical commodities and positions in futures and forward contracts that were not fully collateralized) while the index uses no leverage. Without being able to compare the levels of risk, an absolute conclusion that his portfolio did or did not outperform the index is impossible to formulate. With the appropriate relative risk information, we could, for example, compute the Sharpe ratios of Bandé's portfolio and of the index and thereby have a means to compare the overall performance.

Answer c is incorrect because we're told that fully collateralized physical commodities and fully collateralized commodities futures performed very similarly; therefore, the inability to formulate a conclusion more likely stems from the presence of leverage than the presence of physical commodities.

Reading:

Portfolio Performance Evaluation

LOS: Contrast return attribution and risk attribution; contrast macro and micro return attribution.

Question 6 relates to Alternative Investments

PK&C Case Scenario

6.1 Of the strategies about which Taylor has asked Montebello, the one that will *least likely* meet Taylor's objectives is:

a. Global Macro
b. Managed Futures
c. Merger Arbitrage

Merger arbitrage strategies are characterized by a number of small, positive returns and occasional large, negative returns; i.e., negative skewness. As Taylor wants positive skewness, this makes merger arbitrage an inappropriate strategy. Note that because of the idiosyncratic nature of mergers, such a strategy may provide the diversification benefit that Taylor seeks.

Answers a. and b. are incorrect: both global macro strategies and managed futures strategies offer diversification benefits to long-only equity portfolios, and both tend to have returns with positive skewness.

Reading:

Hedge Fund Strategies

LOS: Discuss investment characteristics, strategy implementation, and role in a portfolio of event-driven hedge fund strategies.

LOS: Discuss investment characteristics, strategy implementation, and role in a portfolio of opportunistic hedge fund strategies.

6.2 The *most likely* effects (better or worse) that adding the Kamara Fund to Offerman's portfolio will have on the portfolio's Sharpe ratio and maximum drawdown, respectively, are:

	Sharpe Ratio	Maximum Drawdown
a.	Better	Worse
b.	Worse	Better
c.	Worse	Worse

The Kamara Fund has a higher annual return than Offerman's portfolio, and, although the Fund's standard deviation of returns is higher than that of Offerman's portfolio, the extremely low correlation of returns will result in a lower standard deviation of returns for the combined portfolio (9.20%, in fact). With a higher expected return and a lower standard deviation of returns, the Sharpe ratio will be higher, a better result. However, the Fund's returns have a negative skew versus the portfolio's positive skew. Because negative skewness contributes strongly to the maximum drawdown (more negative skewness suggests greater drawdowns), the new portfolio is likely to fare worse for maximum drawdown.

Reading:

Hedge Fund Strategies

LOS: Evaluate the impact of an allocation to a hedge fund strategy in a traditional investment portfolio.

6.3 Given Mohebi's preferences, the type of hedge fund strategy that Montebello should recommend to him is *most likely*:

a. Fund-of-funds
b. Managed futures
c. Short-bias (equity)

Mohebi wants a low-risk investment which rules out a short-bias equity strategy: they generally have moderate risk. He also wants low leverage which rules out managed futures: they generally have high leverage. A fund-of-funds strategy generally has low risk and low leverage. It also generally has low liquidity, which is not a problem for Mohebi. Finally, the fund-of-funds manager handles the due diligence on the underlying funds, which is exactly what Mohebi wants.

Reading:

Hedge Fund Strategies

LOS: Discuss investment characteristics, strategy implementation, and role in a portfolio of multi-manager hedge fund strategies.

6.4 The number of *incorrect* statements that Toha made to Szoboszlai is *most likely*:

a. Zero (0)
b. One (1)
c. Two (2)

Statement 1 is correct in all of its particulars.

Statement 2 is incorrect: in a fund of one, the counterparties to a derivative contract must approve the general partner, not the limited partner. In an SMA, the counterparties would each have to approve the client.

Statement 3 is correct in all of its particulars.

Reading:

Asset Allocation to Alternative Investments

LOS: Discuss investment considerations that are important in allocating to different types of alternative investments.

Question 7 relates to Derivative Securities

Karthala Financial Case Scenario

7.1 **Identify** which strategy (collar, protective put, long seagull spread, short seagull spread) is *most appropriate* for Hernandez' portfolio.

The most appropriate strategy for Hernandez' portfolio is a long seagull spread.

Calculate the cost of the *most appropriate* strategy per GBP 1,000.

Starting with a long position in the underlying, a long (bullish) seagull spread can be constructed with a long put at EUR 1.14, a short call at EUR 1.20, and a long call at EUR 1.26. The net cost is:

$$\text{EUR } 21.60 - \text{EUR } 56.63 + \text{EUR } 31.40 = \text{EUR } -3.63$$

Note that the net cost is negative; i.e., the spread generates cash at inception.

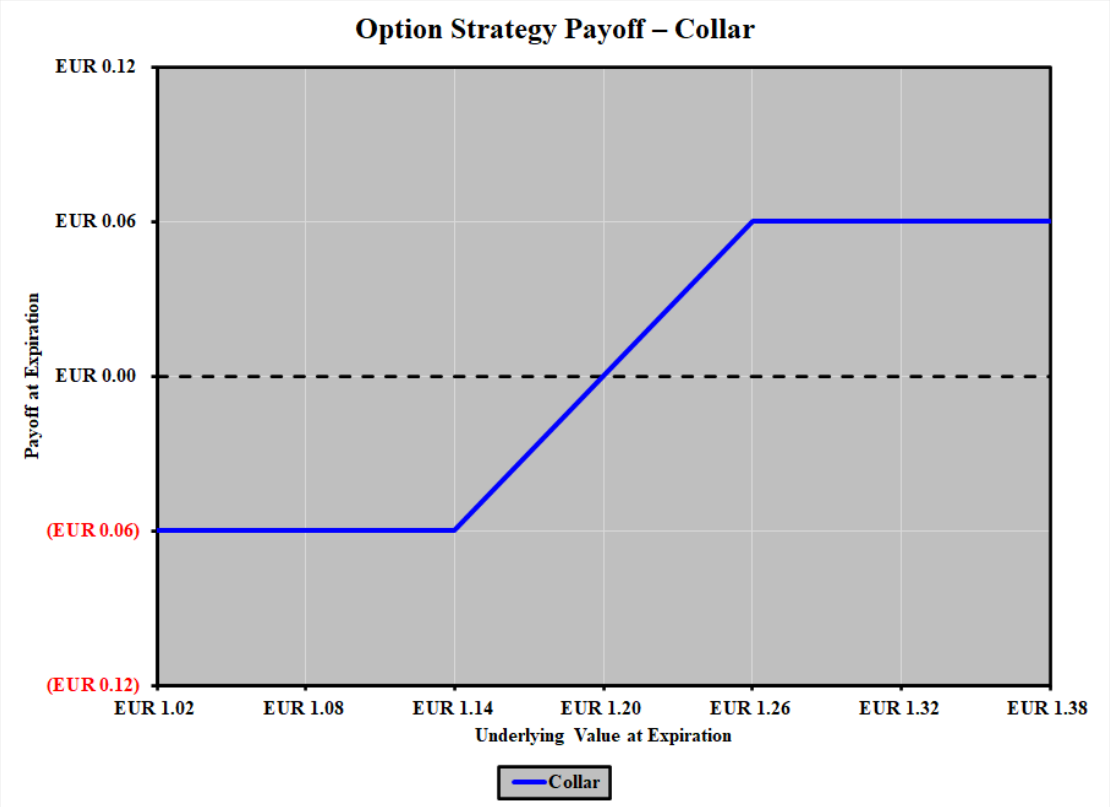
(An alternative construction of a long (bullish) seagull spread, starting with a long position in the underlying, uses a long put at EUR 1.26, a short put at EUR 1.20, and a second long put at EUR 1.14. The net cost is:

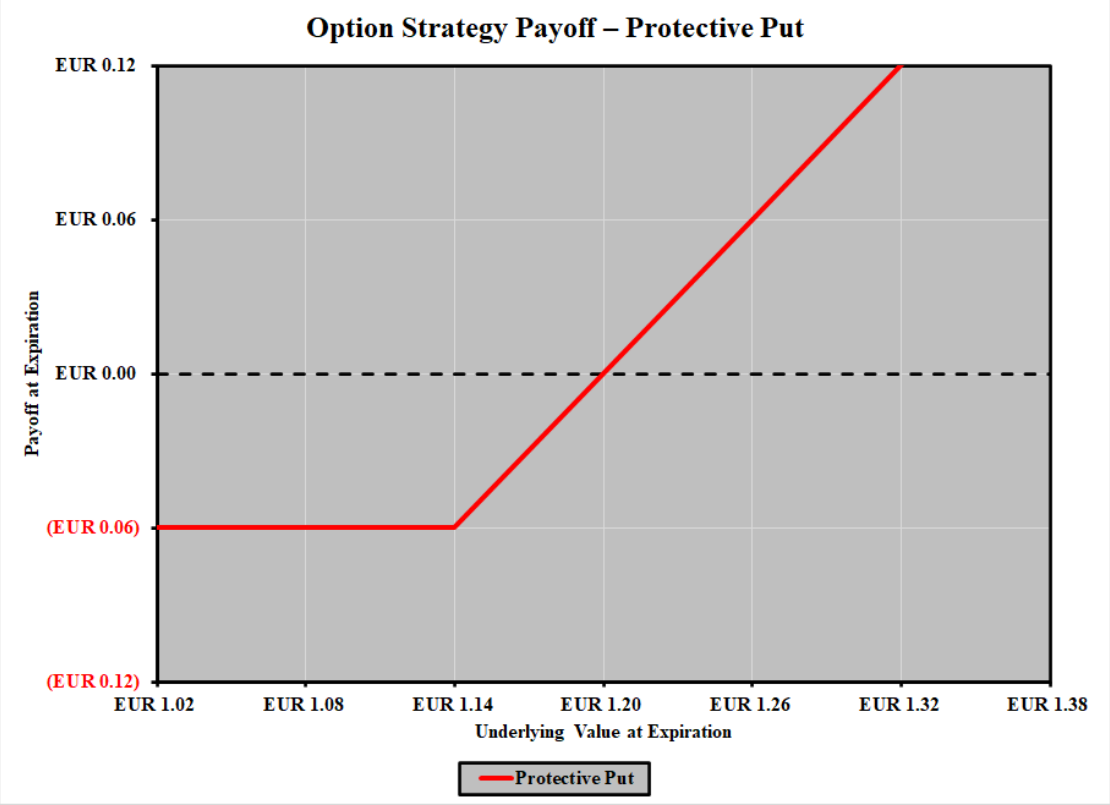
$$\text{EUR } 78.99 - \text{EUR } 44.81 + \text{EUR } 21.60 = \text{EUR } 55.78$$

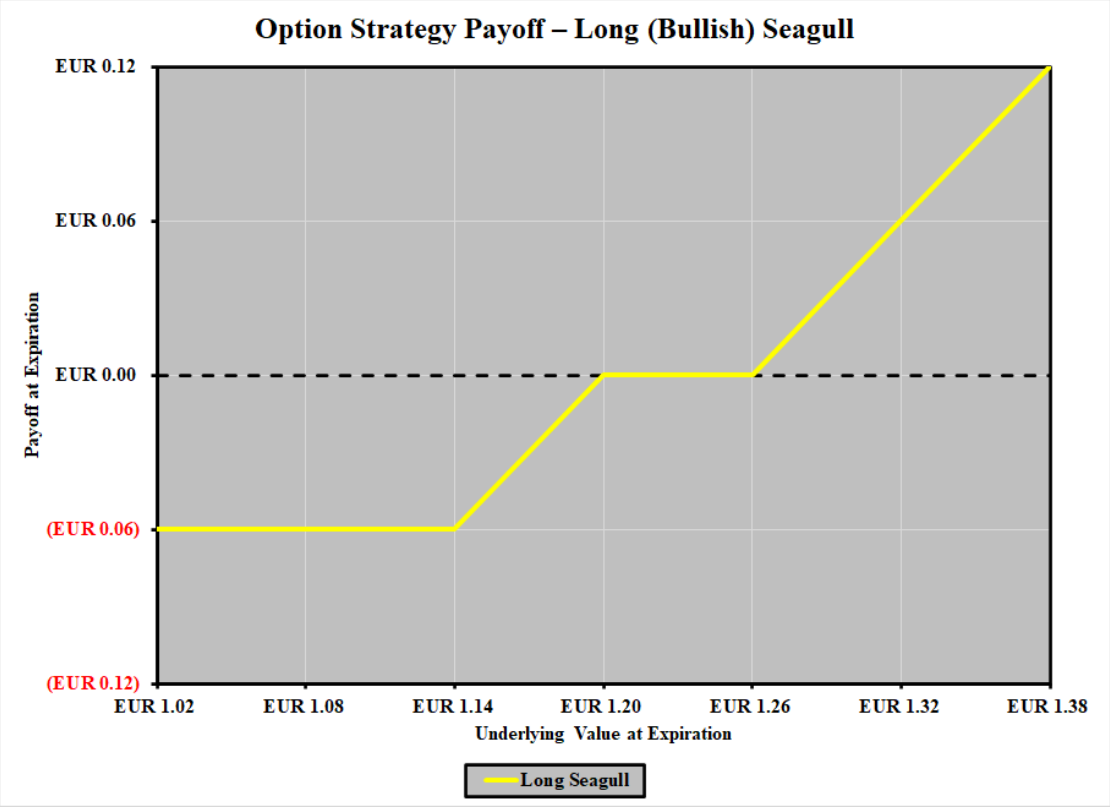
Note that the cost of this construction exceeds 1% of the spot EUR/GBP price. So, this construction is not appropriate.)

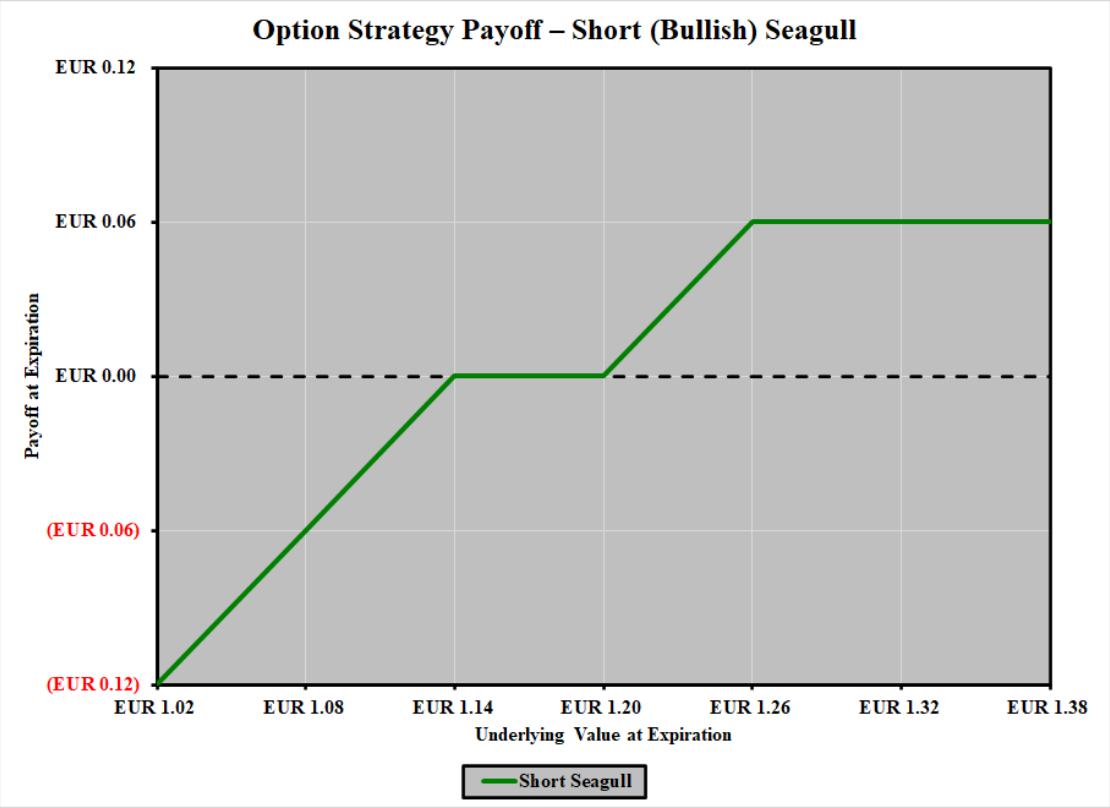
Note: the collar and the short seagull spread will not provide unlimited upside; furthermore, the short seagull does not provide guaranteed downside protection.

Note: While a protective put (at EUR 1.14) provides the downside protection and the unlimited upside, its cost is EUR 21.60, which is more than 1% of the spot EUR/GBP price.









Allocation of marks:

1 mark for writing "Long seagull spread"

3 marks for the correct cost (EUR −3.63)

If the calculated value is incorrect:

1 mark for the correct option positions (long put, short put, long call)

1 mark for the correct option prices (EUR 21.60, EUR −56.63, EUR 31.40)

1 mark for the correct total of the option prices

(Note: no marks are earned for computations on an incorrect approach.)

Reading:

Currency Management: An Introduction

LOS: Describe trading strategies used to reduce hedging costs and modify the risk–return characteristics of a foreign-currency portfolio.

7.2 **Identify** which option Hoxhallari should *buy* (type and strike), and which option Hoxhallari should *write* (type and strike), to implement Abdallah 's suggested strategy. **Calculate** the total cost to implement the strategy (in EUR).

Option to *buy*

Hoxhallari should buy the EUR 1.1182 strike call option.

Option to *write*

Hoxhallari should write the EUR 0.9134 strike put option.

Note from Exhibit 2 that the call with a strike price of EUR 1.1182 has a delta of 0.25: the first component of a 25-delta risk reversal. The put in a 25-delta risk reversal has a delta of −0.25, which means that the call with the same strike price will have a delta of +0.75 ($\Delta_{call} = \Delta_{put} + 1$). The call with a strike price of EUR 0.9134 has a delta of +0.75.

Total cost

Because the portfolio has a short position in CHF, Hoxhallari needs a *long* risk reversal. The net cost per CHF 1,000 is:

$$\text{EUR } 20.37 - \text{EUR } 23.68 = \text{EUR } -3.31$$

Therefore, the total cost for CHF 30 million is:

$$\text{Total Cost} = (\text{EUR } -3.31)\left(\frac{\text{CHF } 30{,}000{,}000}{\text{CHF } 1{,}000}\right) = \boxed{\text{EUR } -99{,}300}$$

Note that this is a negative cost; i.e., Hoxhallari will receive EUR 99,300 when he creates the risk reversal.

Allocation of marks:

1 mark for specifying the EUR 1.1182 strike call option to buy

1 mark for specifying the EUR 0.9134 strike put option to write

2 marks for the correct total cost (EUR −99,300)

If the calculated value is incorrect:

1 mark for the correct total of the option prices per CHF 1,000 (EUR −3.31)

1 mark for multiplying the correct total per CHF 1,000 by 30,000

Reading:

Currency Management: An Introduction

LOS: Describe trading strategies used to reduce hedging costs and modify the risk–return characteristics of a foreign-currency portfolio.

7.3 **Determine** whether Majer should *accept* or *reject* the carry trade.

Majer should reject the carry trade.

Justify your determination.

The arbitrage-free 6-month forward rate, which is the rate at which Majer will break even, is:

$$\frac{\text{BRL } 5.3278}{\text{EUR } 1.0}\left(\frac{1+\frac{12.77\%}{2}}{1+\frac{4.04\%}{2}}\right)=\frac{\text{BRL } 5.6680}{\text{EUR } 1.0202}=\frac{\text{BRL } 5.5558}{\text{EUR } 1.0}$$

Note that the arbitrage-free forward rate is less than the expected spot rate:

$$\text{BRL/EUR } 5.5558 < \text{BRL/EUR } 5.6000$$

Therefore, if Majer doesn't hedge the exchange rate, he expects that it will cost more to convert BRL back to EUR. Therefore, he will end up with fewer EUR than are needed to break even, so the expected holding period return will be negative.

Alternatively,

The interest rate differential is:

$$\frac{12.77\%}{2} - \frac{4.04\%}{2} = \underline{\underline{4.365\%}}$$

The expected gain/loss on the exchange rate is:

$$\frac{\text{BRL/EUR } 5.3278}{\text{BRL/EUR } 5.6000} - 1 = \underline{\underline{-4.8607\%}}$$

Therefore, the expected overall return is approximately:

$$4.365\% - 4.8607\% = \underline{\underline{-0.4957\%}}$$

Thus, the expected holding period return is negative.

A more accurate alternative:

The gain from the foreign investment compounded with the exchange rate loss:

$$\left(1 + \frac{12.77\%}{2}\right)(1 - 4.8607\%) - 1 = \underline{\underline{1.2139\%}}$$

After paying off the interest on the loan, the expected overall return is:

$$1.2139\% - 2.02 = \underline{\underline{-0.8061\%}}$$

The steps in the carry trade process, starting with EUR 1 million, are:

1. Borrow EUR 1,000,000 for 6 months @ 4.04% per year, or 2.02% for 6 months
2. Convert EUR 1,000,000 to BRL 5,327,800 @ BRL/EUR 5.3278
3. Invest BRL 5,327,800 for 6 months @ 12.77% per year, or 6.385% for 6 months
4. Six months later, have BRL 5,667,980
5. Convert BRL 5,667,980 to EUR 1,012,139 @ BRL/EUR 5.6000
6. Repay loan with interest: EUR 1,020,200
7. Loss: EUR 8,061, or −0.8061%

Note that the interest rate differential of −0.4957% is ***not*** a particularly good approximation to the holding period return of −0.8061%. The higher the interest rate differential, the worse the approximation to the actual (compounded) return.

Note: rounding to 2 decimal places (−0.50% for the approximation, or −0.81% for the actual return) will earn full marks.

Allocation of marks:

1 mark for writing "Reject"

Either:

1 mark for the arbitrage-free forward rate (BRL/EUR 5.5558)

1 mark for specifying that the arbitrage-free forward rate is less than the expected spot rate

1 mark for concluding that the holding period return is negative.

or:

3 marks for the correct calculation of the (net) holding period return (−0.8061%)

or:

3 marks for the correct calculation of the approximate (net) holding period return (−0.4957%)

Reading:

Currency Management: An Introduction

LOS: Compare active currency trading strategies based on economic fundamentals, technical analysis, carry-trade, and volatility trading.

Question 8 relates to Capital Market Expectations

CSCM Case Scenario

8.1 For the mysterious Caribbean market, based on the Grinold-Kroner model, **calculate** the expected (annual) repricing return, cash flow return, and real earnings growth.

Repricing return

The repricing return is defined as the percentage change in the P/E ratio. According to the Grinold-Kroner model:

$$E(R_e) \approx \frac{D}{P} + (\%\Delta E - \%\Delta S) + \%\Delta \frac{P}{E}$$

Here,

$$9.1\% \approx 2.3\% + [5.4\% - 1.3\%] + \%\Delta \frac{P}{E}$$

$$\text{repricing return} = \%\Delta \frac{P}{E} \approx 9.1\% - 2.3\% - [5.4\% - 1.3\]$$

$$= 9.1\% - 2.3\% - 5.4\% + 1.3\%$$

$$= \boxed{2.7\%}$$

Cash flow return

The cash flow return is defined as the dividend yield less the percentage change in shares outstanding. Here,

$$\text{cash flow return} = \frac{D}{P} - \%\Delta S = 2.3\% - 1.3\% = \boxed{1.0\%}$$

Real earnings growth

The nominal earnings growth return is defined as the real earnings growth plus inflation. Here,

$$\text{nominal earnings growth return} = \%\Delta E = \text{real earnings growth} + \text{inflation}$$

$$\text{real earnings growth} = \%\Delta E - \text{inflation}$$

$$= 5.4\% - 3.6\% = \boxed{1.8\%}$$

Allocation of marks:

2 marks for the correct repricing return (2.7%)

If the answer is incorrect:

1 mark for the correct formula for expected return per Grinold-Kroner (or for the correct formula for repricing return)

1 mark for the correct calculation of the repricing return

2 marks for the correct cash flow return (1.0%)

If the answer is incorrect:

1 mark for the correct formula for cash flow return

1 mark for the correct calculation of the cash flow return

2 marks for the correct real earnings growth (1.8%)

If the answer is incorrect:

1 mark for the correct formula for earnings growth return

1 mark for the correct calculation of the real earnings growth

Reading:

Capital Market Expectations, Part 2: Forecasting Asset Class Returns

LOS: Discuss approaches to setting expectations for equity investment market returns.

8.2 **Evaluate** *each* of the author's conclusions about Pompeia's ability to service its sovereign debt.

Conclusion 1

The conclusion is inaccurate.

A real growth rate less than 4% suggests that Pompeia may have a very difficult time catching up with its more developed neighbors. Furthermore, a real growth rate of 3.7% and a nominal growth rate of 13.2% suggests an annual inflation rate of about 9.5% (= 13.2% − 3.7%), which may lead to a devaluation of the julio should it persist.

Conclusion 2

The conclusion is inaccurate.

The author is correct that a debt-to-GDP ratio of 107% is high enough to cause concern about Pompeia's ability to pay its sovereign debt, but is incorrect with respect to developed markets. A debt-to-GDP ratio of 70% to 80% would likely be a moderate concern for a developed economy, but 107% is well above that, so it would cause concern for developed markets and emerging markets alike.

Allocation of marks:

For *each* conclusion:

1 mark for stating a correct decision: whether the author's conclusion is accurate or inaccurate

2 marks for a correct justification of the decision

(Note: no marks are earned for justifying an incorrect decision.)

Reading:

Capital Market Expectations, Part 2: Forecasting Asset Class Returns

LOS: Discuss risks faced by investors in emerging market fixed-income securities and the country risk analysis techniques used to evaluate emerging market economies.

Question 9 relates to the Asset Manager Code

IAK Case Scenario

9.1 With regard to providing information to their clients, do IAK's procedures *most likely* comply with the requirements of the Asset Manager Code?

a. No
b. Yes, because third-party confirmation or review is recommended, but it is not required
c. Yes, because copies of account statements and trade confirmations from the custodian bank meet the requirements and recommendations

The Code states:

D.3 Managers must ensure that portfolio information provided to clients by the Manager is accurate and complete and arrange for independent third-party confirmation or review of such information.

The recommendations and guidance state that, "The confirmation of portfolio information may take the form of an audit or review, as is the case with most pooled vehicles, or may take the form of copies of account statements and trade confirmations from the custodian bank where the client assets are held."

Reading:

Asset Manager Code of Professional Conduct

LOS: Determine whether an asset manager's practices and procedures are consistent with the Asset Manager Code.

9.2 By allowing managers to participate in limited partnerships alongside clients, do IAK *most likely* violate the requirements or recommendations of the Asset Manager Code?

a. Yes
b. No, because in that situation a participating manager is considered a client of IAK
c. No, because there is no indication that participation by managers disadvantages IAK's clients

The Code states:

C.2 Managers must give priority to investments made on behalf of the client over those that benefit the Managers' own interests.

The recommendations and guidance state that, "In some investment arrangements, such as limited partnerships or pooled funds, Managers put their own capital at risk alongside that of their clients to align their interests with the interests of their clients. These arrangements are permissible only if clients are not disadvantaged."

Here, there is no indication that clients are disadvantaged by managers' participation; indeed, the case facts state clearly that all investors will be treated identically with regard to capital calls and investment returns.

Note that managers are not clients of the firm, even if they participate in firm-sponsored investment pools (such as limited partnerships).

Reading:

Asset Manager Code of Professional Conduct

LOS: Determine whether an asset manager's practices and procedures are consistent with the Asset Manager Code.

9.3 Do IAK's disclosures of risk management processes and related information *most likely* comply with the requirements or recommendations of the Asset Manager Code?

a. They do not comply with the requirements
b. They comply with the requirements, but not with the recommendations
c. They comply with both the requirements and the recommendations

The Code states:

F.4.1 Managers must disclose risk management processes.

The recommendations and guidance state that, "Managers must disclose their risk management processes to clients. Material changes to the risk management process also must be disclosed. Managers should further consider regularly disclosing specific risk information and specific information regarding investment strategies related to each client. Managers must provide clients information detailing what relevant risk metrics they can expect to receive at the individual product/portfolio level."

Because IAK is merely considering providing information detailing what risk metrics clients can expect to receive, they do not (yet) comply with this requirement.

Reading:

Asset Manager Code of Professional Conduct

LOS: Determine whether an asset manager's practices and procedures are consistent with the Asset Manager Code.

9.4 Concerning the item about asset valuation when third-party quotes are not readily available, Mustafa should *most likely*:

a. Conclude that IAK's approach is adequate, and not recommend any changes
b. Recommend that IAK use independent third-party valuation experts for all such valuations
c. Recommend that IAK create an independent board of directors and charge them with the responsibility of valuing such assets (employing outside experts as they see fit)

The Code states:

E.2 Managers must use fair-market prices to value client holdings and apply, in good faith, methods to determine the fair value of any securities for which no independent, third-party market quotation is readily available.

Having the managers (whose compensation may be tied to IAK's generation of management and performance fees) determine the asset valuation (on which those fees are based) constitutes a clear conflict of interest.

Mustafa recommending the use of independent third-party valuation experts follows the guidelines, which read, in part, "These conflicts may be overcome by transferring responsibility for the valuation of assets (including foreign currencies) to an independent third party. For pooled funds that have boards of directors comprising independent members, the independent members should have the responsibility of approving the asset valuation policies and procedures and reviewing the valuations. For pooled funds without independent directors, we recommend that this function be undertaken by independent third parties who are expert in providing such valuations."

Establishing a board of directors for the sole purpose of valuing assets for which there are no readily available market quotes seems, at the very least, extravagant.

Reading:

Asset Manager Code of Professional Conduct

LOS: Recommend practices and procedures designed to prevent violations of the Asset Manager Code.

Question 10 relates to Institutional Investors

Republic of Doniacali Case Scenario

10.1 **Evaluate** *each* of the government's objectives for the fund.

Objective 1

Objective 1 is inappropriate for the fund.

Because the fund is financed with long-term (10-year and 20-year) bonds, a short-term return goal is insufficient. An appropriate objective would be to achieve a **long-term** rate of return that exceeds the cost of carry for foreign currencies.

Objective 2

Objective 2 is appropriate for the fund.

Because the fund holds foreign currencies, at the very least the return on those currencies should be sufficient to cover inflation, even if that exceeds the cost of funding the reserves (in the local currency); this helps to maintain the long-term value of assets in a fund that has, essentially, long-term liabilities.

Objective 3

Objective 3 is inappropriate for the fund.

Objective 3 is appropriate for a development fund that is denominated in local currency, not for a reserve fund denominated in foreign currency. While any excess returns on the fund could be used to finance local infrastructure projects, that should not be an objective of a reserve fund.

Allocation of marks:

For *each* objective:

1 mark for stating a correct conclusion: whether the objective is appropriate or inappropriate

2 marks for justifying the conclusion

(Note: no marks are earned for justifying an incorrect conclusion.)

Reading:

Portfolio Management for Institutional Investors

LOS: Evaluate the investment policy statement of an institutional investor.

10.2 Based on the information in Exhibit 1, **identify** *three* specific characteristics of Sansot's proposed investment portfolio that are inappropriate.

Characteristic 1

The expected return is too low.

The expected return is:

$$0.10(1\%)+0.35(3\%)+0.05(4\%)+0.30(9\%)+0.10(7\%)+0.05(12\%)+0.05(11\%)$$

$$=\underline{\underline{5.90\%}}<5.95\%$$

Note that you can simplify the calculation by combining returns with the same weights:

$$0.10(1\%+7\%)+0.35(3\%)+0.05(4\%+12\%+11\%)+0.30(9\%)$$

$$=0.10(8\%)+0.35(3\%)+0.05(27\%)+0.30(9\%)$$

$$=\underline{\underline{5.90\%}}$$

Characteristic 2

The portfolio has too much cash.

The cash requirement is 5.95%: to pay the coupons on the budget stabilization bonds. 6% cash or 7% cash might be OK (although less is probably needed as the investments will generate cash in the form of coupon payments and dividends), but 10% cash is too much.

Characteristic 3

Too little invested in foreign assets.

– or –

Too much invested in domestic assets.

Allocation of marks:

1 mark for identifying each inappropriate characteristic

Reading:

Portfolio Management for Institutional Investors

LOS: Evaluate the investment portfolio of a private DB plan, sovereign wealth fund, university endowment, and private foundation.

Question 11 relates to Capital Market Expectations and Asset Allocation

EACA Case Scenario

11.1 QAM's approach to the management of portfolio 386-M-2 is *most likely*:

a. Asset-only
b. Goals-based
c. Liability-relative

Common risk concerns for asset-only portfolios are return volatility, risk relative to a benchmark, and downside risk. Return volatility can be measured with standard deviation of returns, risk relative to a benchmark by tracking error or Sharpe ratio (compared to the Sharpe ratio of the benchmark), and downside risk by Sortino ratio, maximum drawdown, VaR, CVaR, and others. This is exactly what Ojamaa outlined for Wrensford.

A common risk concern for a goals-based portfolio is the probability of failing to meet the goals, which might be measured as a weighted sum of the risks of failing to meet each goal individually.

Common risk concerns for a liability-relative portfolio are the probability of having insufficient funds available to pay obligations when they come due, or the volatility (or magnitude) of contributions needed to fund liabilities. Risk is often measured relative to assets and liabilities in combination (e.g., surplus volatility).

Reading:

Overview of Asset Allocation

LOS: Contrast concepts of risk relevant to asset-only, liability-relative, and goals-based asset allocation approaches.

11.2 The *most appropriate* portfolio management approach for QAM to use on the Plan's investment portfolio is:

a. Surplus optimization
b. Hedging/return-seeking
c. Integrated asset-liability

Key characteristics of a hedging/return seeking portfolio are that it:

- Separates the portfolio into two sub-portfolios: one that hedges the liabilities, and another that attempts to grow the surplus
- Requires a surplus (e.g., a positive funded status for a pension plan)
- Is relatively simple to implement and understand
- Can handle linear and non-linear correlations (of, say, asset returns and liability growth)
- Generally offers a conservative level of risk
- Optimizes over a single period

All of these characteristics are acceptable to the Fund's trustees.

Answer a. is incorrect because surplus optimization cannot handle non-linear correlations.

Answer c. is incorrect because an integrated asset-liability approach can be fairly complex, which the trustees want to avoid.

Reading:

Principles of Asset Allocation

LOS: Discuss approaches to liability-relative asset allocation.

11.3 Of the remarks made by Wrensford and Akanji, it is *most likely* the case that:

a. Wrensford's remark is accurate, but Akanji's is not
b. Akanji's remark is accurate, but Wrensford's is not
c. Wrensford's remark and Akanji's remark are both accurate

Because cash (short-term fixed income) essentially earns a short-term floating rate, of which inflation is a component, cash tends to be stable even when inflation is above expectations. Longer-term bonds, however, with fixed coupon payments, tend to lose value when inflation is above expectations, as the coupon rate does not include the higher inflation component while the discount rate does. Therefore, Wrensford's remark is accurate.

Stocks tend to lose value when inflation is above expectations (though there are exceptions, particularly for the stock of a company that can pass along inflation-driven cost increases to its customers). Therefore, Akanji's remark is inaccurate. He is correct about real estate, however.

Reading:

Capital Market Expectations, Part 1: Framework and Macro Considerations

LOS: Explain the relationship of inflation to the business cycle and the implications of inflation for cash, bonds, equity, and real estate returns.

11.4 Concerning Niño's and Shome's comments about VCV matrices, it is *most likely* the case that:

a. Only Niño's comment is accurate
b. Only Shome's comment is accurate
c. Both Niño's comment and Shome's comment are accurate

Niño's comment is accurate: a VCV matrix developed from the asset returns is consistent (i.e., converges to the true VCV matrix as the sample size increases) and unbiased (i.e., its expected value is the true VCV matrix).

Shome's comment is also accurate: a VCV matrix based on a factor model may be (indeed, likely is) inconsistent, and it may be (again, likely is) biased. She is also correct that the number of covariances to estimate in a factor-based VCV matrix can be substantially less than in the corresponding asset-based VCV matrix. For example, a portfolio with 50 assets would require 1,225 covariance estimates for the asset-based VCV matrix. If there are 10 factors in the factor model for those asset returns, the factor-based VCV matrix would require only 45 covariances to be estimated. The asset-based VCV matrix thus requires 27 times as many covariance estimates as the factor-based VCV matrix.

Reading:

Capital Market Expectations, Part 2: Forecasting Asset Class Returns

LOS: Discuss methods of forecasting volatility.