**Level III 2024 Practice Exam**
**2 ⅕ Hours (132 Minutes)**

Session 1 of the 2024 Practice Exam has 11 question sets. The format consists of either a free form constructed response question set (essay), or a question set consisting of a vignette or a short case followed by four multiple choice questions based on the vignette. Each question set is allocated 12 minutes for a total of 132 minutes.

| Question Set | Topic | Minutes |
|---|---|---|
| 1 | Economics | 12 |
| 2 | Fixed Income | 12 |
| 3 | Portfolio Management – Trading | 12 |
| 4 | Fixed Income | 12 |
| 5 | Derivatives | 12 |
| 6 | Equity Investments | 12 |
| 7 | Derivatives | 12 |
| 8 | Portfolio Management – Private Wealth | 12 |
| 9 | Fixed Income | 12 |
| 10 | Portfolio Management – Institutional | 12 |
| 11 | Equity Investments | 12 |
| | | |
| | **Total** | **132** |

**QUESTION SET 1**
**TOPIC: ECONOMICS**
**TOTAL POINT VALUE OF THIS QUESTION SET IS 12 POINTS**

Sam Pell, an analyst at Supreme Capital, is tasked with setting up and managing a fixed-income portfolio. He predominantly employs the building block approach when forecasting returns.

Pell is asked by the firm's CIO to explore emerging market bonds, specifically government bonds from Country A. Country A, an emerging economy, has been under the same leadership for the past decade, during which aggressive growth policies were enacted. Although these policies resulted in nominal growth that surpassed the trend, the real GDP growth rate has recently averaged 3%. Additionally, the nation's debt-to-GDP ratio has increased to 90%, while its foreign exchange reserves cover only 75% of its short-term debt.

Pell's colleague, Charlie Hawk, is responsible for forecasting equity returns and utilizes the Grinold–Kroner model. Country B is a developed economy. Hawk expects Country B to have:

- a 3.0% dividend yield
- a 0.5% rate of net share repurchases
- a long-term corporate earnings growth rate of 1% per year
- nominal GDP growth of 2% per year
- an expansion rate of P/E multiples of 0.2% per year

When analyzing Country B, Hawk notices how well its real estate market has performed over the last 10 years. Based on his equity market forecast components, Hawk anticipates that Country B's central bank will begin increasing short-term interest rates. This strategy aims to moderate the economy and curtail the general availability of credit.

Due to its preference to have a significant amount of data on any asset class it invests in, Supreme Capital primarily invests in public markets. However, recently Supreme started to consider private markets, such as private real estate, private equity, and hedge funds.

1. Utilizing the building block approach, government bonds of Country A and the government bonds of a developed economy are *most likely* to have a similar:

   A. term premium.
   B. credit premium.
   C. currency premium.

2. Assuming a forecast horizon of 10 years, what is Hawk's equity market per annum return forecast for Country B?

   A. 4.5%
   B. 4.7%
   C. 5.0%

3. Considering Hawk's expectations, which property type within Country B's real estate market is *most likely* to undergo the greatest change in expected returns over a specified period?

   A. Industrial
   B. Health care
   C. Retail malls

4. When constructing a variance-covariance (VCV) matrix, what aspect of private markets must Supreme Capital understand in order to avoid misinterpreting the potential diversification benefits of these asset classes?

   A. Volatility clusters
   B. Shrinkage estimation
   C. Unobservable returns

**QUESTION SET 2**
**TOPIC: FIXED INCOME**
**TOTAL POINT VALUE OF THIS QUESTION SET IS 12 POINTS**

Leonard Jennevin serves as a portfolio manager at Riviera Partners, a boutique investment firm. Jennevin is in charge of actively managing fixed-income portfolios, which consist primarily of investment-grade corporate bonds.

Over the past 12 months, the yield curve has been stable, concave, and upward sloping. The portfolio's benchmark is a broad index with a duration of eight years. However, according to the investment mandate, Jennevin is not obligated to match the index's duration. Jennevin outlines three potential approaches to constructing a client's fixed-income portfolio: a barbell, a bullet, and a laddered portfolio. Jennevin assumes that both the barbell and bullet portfolios have the same duration. When determining the most suitable bond portfolio for a new client, he takes into account three potential scenarios regarding changes in the yield curve over the coming year:

Scenario 1: instantaneous upward parallel shift of 100 basis points

Scenario 2: no change in the shape of the yield curve

Scenario 3: instantaneous "negative butterfly" twist

Ron Ramos, Jennevin's supervisor, reviews Jennevin's analysis and observes that, when all other factors, are equal, such as duration, cash flow yield, and credit risk, the barbell portfolio will exhibit the highest convexity, while the bullet portfolio will display the lowest convexity.

1. Under Scenario 1, which of the following portfolio construction strategies is *most* appropriate?

   A. Selling convexity
   B. Choosing a bullet portfolio
   C. Choosing a barbell portfolio, with the bonds with durations of 1 year and 8 years

2. Under Scenario 2, which of the following portfolio construction strategies is *most* appropriate?

   A. Selling convexity
   B. Buying convexity
   C. Decreasing the portfolio's duration

3. Under Scenario 3, which of the following portfolio construction strategies is *most* appropriate?

    A. A bullet portfolio
    B. A barbell portfolio
    C. A laddered portfolio

4. In his analysis of convexity, Ramos is correct:

    A. only that a bullet has the lowest convexity.
    B. only that a barbell has the highest convexity.
    C. both a bullet has the lowest convexity and a barbell has the highest convexity.

**QUESTION SET 3**
**TOPIC: PORTFOLIO MANAGEMENT – TRADING**
**TOTAL POINT VALUE OF THIS QUESTION SET IS 12 POINTS**

Debbie Wakefield is the head of investment products at Cooper Funds Management. The firm specializes in equity and fixed-income exchange-traded funds (ETFs). Wakefield meets with every portfolio manager at Cooper to review the trading strategies used by each fund and the annual performance of each fund compared to their benchmark. After completing the annual review, Wakefield identifies improvements that can be made to the trading models to 1) generate alpha and 2) reduce trading costs by achieving more efficient execution. Wakefield requests that Cooper implement the following recommendations into the trading models:

Recommendation 1: Trading models should implement lowest possible trading costs to achieve best execution consistently for all trades and enhance annual performance of the ETFs.

Recommendation 2: Fund managers use time-weighted average price (TWAP) to achieve fair and reasonable prices over the trading period throughout the day when there is market noise.

Wakefield meets with Tom Sturrock, portfolio manager of the blue-chip technology ETF (BCT). Sturrock mentions that, with the recent increase in interest rates in the market, investors are shifting from equity ETFs to fixed income ETFs. Sturrock states that he believes BCT is undervalued relative to market expectations and represents an opportunity for Cooper to increase their position in BCT. Wakefield agrees with the recommendation and approves the purchase of 1 million shares of BCT. Sturrock releases the order for market execution when the market price of BCT is $32.75. Details of the executed trades for BCT are presented in Exhibit 1. BCT closes at $33.47 at the end of the day.

**Exhibit 1**

| Trades | Shares Executed | Execution Price |
|---|---|---|
| Trade 1 | 220,000 | $32.80 |
| Trade 2 | 140,000 | $32.92 |
| Trade 3 | 350,000 | $33.08 |
| Trade 4 | 125,000 | $33.24 |

Wakefield consults with Hoover Martinez, portfolio manager of the Corporate Bond ETF (CB), which recently rose by 15%. Martinez advises selling 100,000 shares of CB to rebalance the fixed-income portfolio following CB’s recent increase in value. Wakefield agrees, intending to sell 100,000 CB at $83.56. However, due to an upcoming Federal Open Market Committee meeting, Martinez delays forwarding the order to the trading desk. By the time it's released later that day, CB's market price drops to $83.12. Consequently, only 70,000 shares are executed, which are detailed in Exhibit 2. Cooper incurs a commission of 0.01 per share with no additional fees. By day's end, CB's price drops further to $81.74.

**Exhibit 2**

| **Trades** | **Shares Executed** | **Execution Price** |
|---|---|---|
| Trade 1 | 10,000 | $83.08 |
| Trade 2 | 40,000 | $82.93 |
| Trade 3 | 15,000 | $82.67 |
| Trade 4 | 5,000 | $82.23 |

A. **Discuss** which recommendations by Wakefield are *least likely* correct. **Justify** *each* response.

B. **Calculate** the arrival cost in basis points for the BCT trades.

C. **Calculate** the implementation shortfall in basis points for the CB trades.

**QUESTION SET 4**
**TOPIC: FIXED INCOME**
**TOTAL POINT VALUE OF THIS QUESTION SET IS 12 POINTS**

Eugene Cohen is a fixed income portfolio manager with Astute Investments, a fund management company focused on serving both wealthy individuals and mid-size institutional clients. Cohen meets with one of his clients, Victor Schwarz, a 54-year-old business owner who just retired after successfully selling his oilfield services business.

Cohen explains that Schwarz's unleveraged $12 million bond portfolio is expected to generate an 8% annualized return, which falls below the target return of 11% outlined in Schwarz's IPS. Cohen suggests that, by borrowing, Schwarz may increase his portfolio return to the desired amount. He mentions that Schwarz can borrow funds at a rate of 3% per year.

Additionally, Cohen informs Schwarz that there are alternative methods to borrowing that can also achieve leveraged portfolio exposure, such as utilizing derivatives. Intrigued by this, Schwarz inquires about the distinctions between repurchase agreements and securities lending , as he is unclear about the differences. Cohen clarifies that, although both can be categorized as collateralized lending, they operate somewhat differently. To provide clarity on the workings of the repo market, Cohen cites an example: Astute Investments recently engaged in a five-day repo agreement with an annual rate of 3.5%. For this agreement, they were required to provide $125 million in corporate bonds as collateral, factoring in a 2% haircut set by the lender.

A. **Calculate** the amount of funds Schwarz needs to borrow in order to achieve 11% return from his bond portfolio.

B. **Discuss** *two* methods of achieving leveraged exposure through derivatives instruments. **Explain** how each derivative would be structured to achieve such an exposure.

C. **Discuss** *two* differences between the two alternative methods of leverage that Cohen states can be used.

D. **Calculate** the dollar interest amount paid by Astute Investments to the lender in the five-day repo agreement.

**QUESTION SET 5**
**TOPIC: DERIVATIVES**
**TOTAL POINT VALUE OF THIS QUESTION SET IS 12 POINTS**

Kabir Khan is a senior portfolio strategist at Poly Institutional Advisors, a diversified global financial services firm. Khan is responsible for the creation and maintenance of clients' investment policy statements and investment guidelines.

One of Khan's clients, Acme Generators, holds a $200 million portfolio that is allocated 65% to equities and 35% to bonds. Due to an increase in interest rate volatility and concern about a potential recession, Acme Generators has developed a bearish view on stocks and intends to allocate a greater percentage of the portfolio to bonds. Khan recommends moving 15% of the overall portfolio from equities to bonds using index futures contracts and gathers the portfolio allocation information presented in Exhibit 1.

**Exhibit 1**

| **Equity Portfolio – 65%** | | **Bond Portfolio – 35%** | |
|---|---|---|---|
| Current Portfolio Beta | 1.2 | Current Modified Duration | 5.85 |
| Equity Index Futures Price | 12,500 | Bond Index Futures Price | 113.75 |
| Equity Index Multiplier | 10 | Bond Index Contract Size | $100,000 |
| Equity Index Beta | 1 | Basis Point Value of CTD | $99.72 |
| – | | Conversion Factor | 0.9546 |

Beryl Hedge Fund, another client, holds a concentrated position of $500 million in QQQ, an exchange-traded fund which closely tracks the NASDAQ-100 index of technology stocks in the US. Alex Fisher, CIO at Beryl Hedge Fund, believes that QQQ has increased significantly in the last six months and, a market correction may occur soon.

Fisher is evaluating ways to hedge the concentrated position of QQQ using derivatives. Fisher decides to reduce 40% of the exposure to QQQ with an equity swap that is settled semi-annually, in which Beryl can receive either a fixed or a floating interest rate. Khan conducts market research and recommends a floating rate equity swap where the floating rate is equal to the swap offered floating rate (SOFR) minus 50 bps. After entering the equity swap, the value of the QQQ position declines to $480 million at the first settlement date. The SOFR rate on the first settlement date is 4.50%.

Another client, Gem Insurance, is an insurance company that actively manages its fixed-income portfolio to avoid mismatches between the assets and liabilities. Gem Insurance has sold $100 million of five-year US Treasury bond futures that are expiring soon. The Treasury bond futures contract size is $100,000, and the most recent futures contract settlement price is $135.74. Gem Insurance has various bonds in its portfolio and determines which bond is cheapest to deliver against the futures contract. Gem Insurance presents the three bonds in Exhibit 2 and asks Khan to help them identify the cheapest-to-deliver bond.

**Exhibit 2**

| | Bond A | Bond B | Bond C |
|---|---|---|---|
| Cash Dirty Price | $131.25 | $134.5 | $138.75 |
| Futures Settlement Price | $135.74 | $135.74 | $135.74 |
| Conversion Factor | 0.8925 | 0.9375 | 0.9525 |
| Contract Size | 100,000 | 100,000 | 100,000 |

1. Acme Generators should take which action with Bond Index futures contracts to achieve the desired allocation?

   A. Buy 168 Bond Index futures contracts
   B. Sell 176 Bond Index futures contracts
   C. Buy 176 Bond Index futures contracts

2. Acme Generators should take which action with Equity Index futures contracts to achieve the desired allocation?

   A. Buy 240 Equity Index futures contracts
   B. Sell 288 Equity Index futures contracts
   C. Sell 576 Equity Index futures contracts

3. At the first swap settlement date, Beryl Hedge Fund would:

   A. receive $12,000,000.
   B. receive $24,000,000.
   C. pay $24,000,000.

4. The cheapest-to-deliver bond for Gem Insurance is:

   A. Bond A.
   B. Bond B.
   C. Bond C.

**QUESTION SET 6**
**TOPIC: EQUITY INVESTMENTS**
**TOTAL POINT VALUE OF THIS QUESTION SET IS 12 POINTS**

Louis Sadosky is a portfolio manager engaged in active equity investing, specifically implementing factor-based portfolios using the hedged portfolio approach.

Sadosky's process consists of the following steps:

- Select Factor X as a likely determinant of stock returns.
- Rank the stocks in his universe by Factor X in descending order.
- Divide the ranked list into five distinct quantiles.
- Take a long position in the securities in the top quantile and short the securities in the bottom quantile.
- Realize the net difference in return between the long and the short quantiles.

Average historical monthly quantile returns for Sadosky's quantiles based on Factor X are shown in Exhibit 1.

**Exhibit 1**

| Quantile | Return (%) |
|---|---|
| $Q_1$ | 0.7 |
| $Q_2$ | 1.3 |
| $Q_3$ | 1.1 |
| $Q_4$ | 0.9 |
| $Q_5$ | 0.5 |

Sadosky is also exploring the area of statistical arbitrage via pairs-trading and mean reversion. He has developed a historical correlation matrix for six candidates in the same industry and sector that might be used in a possible pairs-trade in Exhibit 2.

**Exhibit 2**

| | Stock A | Stock B | Stock C | Stock D | Stock E | Stock F |
|---|---|---|---|---|---|---|
| Stock A | 1.0 | – | – | – | – | – |
| Stock B | 0.6 | 1.0 | – | – | – | – |
| Stock C | 0.3 | 0.5 | 1.0 | – | – | – |
| Stock D | 0.4 | 0.0 | 0.2 | 1.0 | – | – |
| Stock E | 0.7 | 0.7 | 0.8 | 0.5 | 1.0 | – |
| Stock F | 0.1 | 0.3 | 0.1 | 0.3 | 0.2 | 1.0 |

A. **Identify** *three* potential drawbacks arising out of the hedged portfolio approach Sadosky uses.

B. **Discuss** *one* possible problem with the average historical monthly quantile returns and Sadosky's stated approach. **Recommend** improvement better action which would improve the effectiveness of the hedged portfolio approach.

C. **Describe** *one* major risk inherent with *any* recommendation described in Part B of this question.

D. **Identify** the *most* effective and the *least* effective combination of securities that Sadosky is exploring to be used in his pairs-trading arbitrage strategy. **Describe** the primary risk if Sadosky implements the strategy.

**QUESTION SET 7**
**TOPIC: DERIVATIVES**
**TOTAL POINT VALUE OF THIS QUESTION SET IS 12 POINTS**

Sean Galligan is a currency management consultant. Galligan's consultancy efforts include investment portfolio analysis, the calculation of hedge ratios for currency exposure, and the generation of currency alpha through active foreign exchange management. Galligan's clients include investment banks, registered investment advisors, hedge funds, asset managers, and institutional investors.

AJ Capital, an investment bank based out of Miami, Florida, hired Galligan to help find profitable opportunities in the market. Ajay Suri, CEO of AJ Capital, is concerned about the Federal Reserve's monetary policy stance for the upcoming six months and anticipates increased volatility in the equity markets. Suri requests that Galligan devise a strategy to generate alpha by taking a directional bullish view on the volatility, but with minimal cost to the firm. Galligan gathers information presented in Exhibit 1 and recommends buying a one-year variance swap on the Russell 2000 Index.

**Exhibit 1**

| | |
|---|---|
| Vega Notional of a One-Year Variance Swap | $22,000,000 |
| Strike of Variance Swap (Quoted as Annual Volatility) | 21.00% |
| Annual Interest Rate | 4.75% |

Six months after taking the long position in the variance swap, the Russell 2000 Index has recorded a realized volatility of 27%. On the same day, Galligan identifies a new six-month variance swap on the Russell 2000 Index with a fair strike of 23%.

Six months after taking the long position in the variance swap, Suri's bullish directional view on the volatility has changed. Suri believes that the volatility has peaked and expects the volatility to remain range bound for the upcoming six months. Suri requests that Galligan now recommend how to mitigate volatility exposure. Galligan makes the following recommendations based upon an expectation of a range bound volatility market.

Recommendation 1: Implement a long volatility straddle that is delta neutral and likely to be profitable.

Recommendation 2: Implement a net short volatility options strategy, which will earn option premiums from out-of-the money expiring options.

Chain Investments, another client of Galligan's, is a crypto currency asset management firm located in Paris, France. Chain Investments has an equity cryptocurrency investment fund (ECIF) that invests in cryptocurrency-related equity investments across the globe. ECIF uses EUR as its reporting currency and holds assets in various currencies, such as EUR, GBP, and USD. Gabriel Durand, CIO at Chain Investments, is concerned about recent scrutiny of crypto businesses by US regulators and intends to hedge ECIF's USD exposure. Durand requests Galligan to suggest a suitable hedging option. After reviewing ECIF's USD exposure and currency volatility characteristics in Exhibit 2, Galligan recommends implementing a minimum-variance hedge.

**Exhibit 2**

| | |
|---|---|
| Assets | USD 897 million |
| Standard Deviation $\sigma(R_{EUR})$ | 1.87% |
| Standard Deviation $\sigma(R_{USD})$ | 3.24% |
| Standard Deviation of Exchange Rate $\sigma(R_{EUR/USD})$ | 2.16% |
| Correlation $\rho$ ($R_{EUR}$ ; $R_{EUR/USD}$) | 0.723 |

A. **Calculate** the value of the variance swap six months from initiation.

B. **Determine** which of Galligan's recommendations should be followed. **Justify** your response.

C. **Formulate** a minimum-variance hedge for Chain Investments' exposure to USD using a forward contract.

**QUESTION SET 8**
**TOPIC: PORTFOLIO MANAGEMENT – PRIVATE WEALTH**
**TOTAL POINT VALUE OF THIS QUESTION SET IS 12 POINTS**

Jacob Strauss recently joined the team at Spectrum Advisors. During his training sessions with supervisor Jimmy Pierce, Strauss comes across a list of services provided to clients. He asks to see a sample of a client's economic balance sheet since he's primarily familiar with the traditional balance sheet style.

Pierce agrees and states:

Statement 1: The only difference between traditional balance sheets and economic balance sheets is the addition of human capital as an asset.

Statement 2: Human capital is the estimated net present value of future earnings and traditionally has a direct relationship with financial assets.

Pierce suggests that he and Strauss review the profile of his long-standing clients, Colin and Robyn Faun. The Fauns have been clients for 40 years. Early in their careers, Colin Faun worked as a commodities trader at a startup company, while Robyn Faun was working as a nurse in a very specialized field in high demand. The Fauns then welcomed twin baby boys and purchased their first condo.

The Fauns have always been conservative investors. Over the years, Pierce adeptly guided their portfolio. Highly sensitive to investment fees, the Fauns received a fee discount from Pierce when they became his inaugural clients. They consistently scrutinized fees associated with mutual funds and other investment products, typically turning down any they perceived as excessively costly.

Pierce has a meeting scheduled with the Fauns, who are now retired and in their 70s. Their boys are grown and financially independent. The overall equity market is expected to oscillate within a tight range, and interest rates have recently risen to cyclical highs due to monetary policy tightening. The expectation is that interest rates have peaked. The Fauns have no debt and would like to generate additional income from their portfolio. The Fauns want to discuss immediate variable annuities since a friend mentioned they can guarantee income for life. Pierce intends to bring informational materials on variable annuity options as well as immediate fixed annuities.

A. **Evaluate** the accuracy of Strauss's *two* statements regarding an economic balance sheet.

B. **Describe** the income volatility of the Fauns at the start of their careers and its potential impact on a recommended portfolio allocation.

C. **Compare** the life insurance needs of the Fauns at the start of their careers versus their needs as 70-year-old clients.

D. **Recommend** the appropriate annuity to recommend for the Fauns. **Justify** your answer with *two* reasons.

**QUESTION SET 9**
**TOPIC: FIXED INCOME**
**TOTAL POINT VALUE OF THIS QUESTION SET IS 12 POINTS**

Gene Jay, Jr., is a portfolio manager for Mangrove Retirement Solutions. The investment committee at Mangrove has made a decision to review fixed income strategies for their existing clients with a particular focus on each investors' personal tax circumstances. The committee has asked Jay to provide some overview of fixed income taxation as well as to develop a questionnaire to assess each client's tax status.

In his overview, Jay makes three comments with regard to fixed income taxation principles in the US.

Comment 1: The two primary sources of taxable investment income are interest income from coupon payments and realized capital gains or losses, which are the difference between sale price and bond cost basis. Often, capital gains are taxed at rates lower than coupon payments. Additionally, many jurisdictions distinguish between short-term and long-term capital gains, typically taxing long-term capital gains at higher rates

Comment 2: Capital losses normally cannot be used to offset income from sources other than capital gains, but if capital losses exceed capital gains in a particular period, they often can be carried forward to a subsequent time period.

Comment 3: Taxes are typically paid only on realized capital gains and coupon payments that have actually been received, and investors seldom have control over the timing of coupon payments and capital gains.

Jay then proceeds with the tax analysis of the two bond positions for which he has been responsible (Exhibit 1). While both positions exhibit similar characteristics, Jay thinks that during the next year, Position A will depreciate in value, while Position B will slightly appreciate.

**Exhibit 1**

| | **Position A** | **Position B** |
|---|---|---|
| Current market value | $11,500,000 | $8,800,000 |
| Purchase price | $10,000,000 | $10,000,000 |
| Capital gains/losses | $1,500,000 | ($1,200,000) |
| Coupon rate | 7.00% | 7.00% |
| Remaining maturity | 5 years | 5 years |

| | |
|---|---|
| Income tax rate | 30% |
| Capital gains tax rate | 12% |

Jay explains that it is critical to understand whether the client has a tax-exempt or taxable status before deciding which position to close. He explains that if an investor is tax exempt, they will be more motivated to liquidate Position A. He also adds that the reason for this motivation is due to a tax loss harvesting strategy.

1. In Comment 1, Jay is incorrect when he:

   A. defines two main sources of taxable investment income.
   B. states that capital gains are frequently taxed at a lower rate.
   C. states that long-term capital gains are typically taxed at a higher rate.

2. In Comment 2, Jay is correct in claiming that:

   A. capital losses can be carried forward to subsequent time periods only.
   B. capital losses normally cannot be used to offset gains from other income sources only.
   C. both capital losses can be carried forward to subsequent time periods and capital losses normally cannot be used to offset gains from other income sources.

3. In Comment 3, Jay is correct in stating that:

   A. investors seldom control the timing of coupon payments and capital gains only.
   B. taxes are typically paid on realized capital gains and coupon payments that have been received only.
   C. both that investors seldom control the timing of coupon payments and capital gains and that taxes are typically paid on realized capital gains and coupon payments that have been received.

4. Regarding the two bond positions, Jay is incorrect in:

   A. claiming that a tax-exempt investor will be motivated to sell Position A.
   B. stating that tax loss harvesting strategy is the reason to liquidate Position A.
   C. claiming that the tax status is critical before deciding which position to liquidate.

**QUESTION SET 10**
**TOPIC: TOPIC: PORTFOLIO MANAGEMENT – INSTITUTIONAL**
**TOTAL POINT VALUE OF THIS QUESTION SET IS 12 POINTS**

Advantic Insurance is one of the 50 largest life and annuity insurers in the US. Over the last decade, the company has successfully grown its business through a focus on serving the target market of customers with household incomes between $80,000 and $150,000. Its largest products are traditional life insurance policies and fixed interest annuities, but its greatest area of growth is in variable annuities.

The firm's assets and liabilities as of the end of its most recent quarter are summarized in Exhibit 1. Advantic reports the investment assets in variable annuity products as separate accounts while reporting the return-of-premium death benefits for those accounts as life insurance liabilities.

**Exhibit 1**

| **Assets** | **Balance Sheet Data ($ millions)** | **Modified Duration** |
|---|---|---|
| Cash and cash equivalents | $ 600 | 0.0 |
| Investment-grade fixed income securities | 24,000 | 12.5 |
| Specialized fixed income securities, including high-yield and convertible bonds | 4,200 | 2.0 |
| Separate accounts | 5,200 | 6.2 |
| Total assets | $ 34,000 | |
| | | |
| **Liabilities** | | |
| Life insurance policy liabilities, including death benefits of variable annuities | $ 17,100 | 16.5 |
| Fixed annuity policy benefits | 8,700 | 8.0 |
| Variable annuity accounts | 5,200 | 6.2 |
| Total liabilities | $ 31,000 | |

The company consistently satisfies regulatory capital requirements. Specifically, around 15% of the specialized fixed income assets and 95% of the cash and investment-grade assets contribute to this regulatory requirement. Advantic does not hold shares in mutual funds, as the insurance code in Advantic's state of domicile excludes them from a regulatory capital classification. A. M. Best gives Advantic an 'A' rating. Additionally, the firm has a $700 million open line of credit and can venture into the bond market if it opts to raise capital.

Exhibit 2 indicates that the yield on liabilities for Advantic is expected to move by 93 bps for every 100 bps of yield change in the asset portfolio (for relatively modest changes) and summarizes the volatilities and correlation of returns for the firm's asset and liability portfolios.

**Exhibit 2**

| | | |
|---|---|---|
| Sensitivity of changes in liability (i) to asset (y) yields | $\Delta i/\Delta y$ = | 0.86 |
| Volatilities of percentage change in market value: | | |
| Standard deviation of percentage change in value, liabilities | $\sigma_{\Delta L/L}$ = | 4.2% |
| Standard deviation of percentage change in value, assets | $\sigma_{\Delta A/A}$ = | 3.4% |
| Correlation between percentage changes in asset and liability values | $\rho$ = | 0.94 |

Advantic's investment team, known for their experience and skill in investment-grade, high-yield, and convertible bond sectors, embarked on a project under the CIO's direction. Their goal was to produce large outperformance for various specialized fixed income strategies by managing them as subaccounts within the insurer's main account. While many strategies did not perform well and were discontinued, the results of four specialized and two investment-grade strategies were promising.

The CIO suggests establishing a new Advantic Funds entity, operated by the existing team, to oversee these six strategies as mutual funds. Assets currently deployed in these strategies, along with $1.2 billion of investment-grade assets, would be transferred into these new funds

A. **Describe** *three* primary traits common to institutional investors that distinguish them from individual investors.

B. **Calculate** the amount of Advantic's equity capital and its modified duration.

C. **Calculate** the volatility of shareholders' equity as the standard deviation of the percentage change in the value of equity capital.

D. **Estimate** the likely impact of the CIO's proposed plan for Advantic Funds on the firm's regulatory capital position in *each* of *three* asset categories: investment-grade fixed income, specialized fixed income, and variable annuities. **Justify** *each* of your *three* estimates.

 

**QUESTION SET 11**
**TOPIC: EQUITY INVESTMENTS**
**TOTAL POINT VALUE OF THIS QUESTION SET IS 12 POINTS**

Kathleen Cheng, a portfolio manager, focuses on companies in the European luxury goods market. Cheng has strong environmental concerns, which she implements using a best-in-class approach to the companies selected for her portfolio.

Cheng believes that securities in the luxury goods market are fairly priced. She does not attempt to identify mispriced securities but instead pursues long-term capital appreciation based on macroeconomic and demographic trends.

Cheng recognizes that luxury goods brands periodically fall in and out of favor. Therefore, while Cheng is sensitive to the impact that a single brand can have on her portfolio, she does not actively manage volatility or downside risk.

Cheng has read about passive factor-based equity strategies and wonders if they are applicable to her portfolio management approach.

1. The implementation methodology employed by Cheng can *best* be described as:

   A. impact investing.
   B. positive screening.
   C. negative screening.

2. Cheng has segmented her investment universe primarily by:

   A. geography.
   B. size and style.
   C. economic activity.

3. Cheng's portfolio performance would *best* be measured using a:

   A. price-weighted index.
   B. equally weighted index.
   C. fundamentally weighted index.

4. Which passive factor-based strategy is *most* similar to Cheng's present portfolio management approach?

   A. Risk-oriented strategies
   B. Return-oriented strategies
   C. Diversification-oriented strategies

**END OF SESSION 1**