Overview for Questions #1-5 of 104

Question ID: 1430420

TOPIC: BEHAVIORAL FINANCE

TOTAL POINT VALUE OF THIS QUESTION SET IS 14 POINTS

Joe and Sara Finnegan are both 62 years old. They are retired and have a combined investable net worth of $2 million. Included in their total wealth is Joe's $500,000 defined-contribution retirement plan that is managed separately. Joe makes the investment decisions for his retirement plan portfolio, but Sara makes the investment decisions for their other portfolio.

Joe's retirement plan is administered by a local bank trust department. The trust department offers its clients a range of portfolio allocations from aggressive to conservative was shown in Exhibit 1. Without regard for asset class characteristics or his own risk and return objectives, Joe selected a portfolio that is equally weighted in each asset class and has made no changes to the portfolio allocation or to the allocation of new deposits to the plan portfolio since inception many years ago. Joe is primarily concerned about potential losses in his account and prefers not to make investment decisions. He is often fearful and anxious about what may happen in his portfolio.

Exhibit 1: Alternative Portfolios

Asset Class	Current Yield	Aggressive Asset Mix	Conservative Asset Mix
Domestic Equity Stocks—Income	4.0%	40%	15%
International Stocks	3.0%	25%	5%
Domestic Bonds	4.0%	5%	50%
International Bonds	4.0%	5%	25%
Alternative Investments	2.0%	25%	5%

At this time, the Finnegans approach Tim Smith in the bank trust department for advice. Smith conducts detailed interviews with the Finnegans and identifies three sets of goals with varying priority. He uses a client questionnaire and determines that their biases are mainly emotional. Smith determines that their asset base is relatively small and concludes that its size will make it difficult to meet their primary goals. He then develops both a goals-based investment plan and one based on traditional finance concepts.

Question #1 of 104

Question ID: 1430421

Identify *two* behavioral characteristics that are evident in Joe's allocation of his retirement plan portfolio. Identify from the following items: *myopic loss aversion, conservatism, 1/n diversification, home bias, status quo bias, and reference dependence.* **Justify** your response regarding each behavioral characteristic identified.

Explanation

1/n diversification: Joe divides his assets equally among all available alternatives.
Status quo bias: Joe has made no changes to his portfolio.

Candidate discussion: Joe may show loss aversion, but that is not the same thing as myopic loss aversion. Myopic loss aversion is a macro issue when large numbers of investors under-allocate to stocks, keeping their prices low and biasing upward their return premium. Joe is not showing conservatism because that is a cognitive error when an initially rational view is formed but then retained without further consideration as new information comes in. Joe made an initial, uninformed, and not well-thought-out decision that he does not change. It is conceivable he has some of these other biases, but we know he exhibited the two selected, so other selections will receive no credit.

Scoring key: (4 points possible)

1 point each for a correct identification and 1 point for supporting it.

(Study Session 1, Module 2.2, LOS 2.c)

Question #2 of 104

Question ID: 1430422

Based solely on his retirement portfolio, which behavioral investor type (BIT) is *most likely* exhibited by Joe?

A) Adventure. ✗

B) Individualist. ✗

C) Guardian. ✓

Explanation

The behavioral type most likely exhibited by Joe is *guardian*.

Scoring key: (1 point possible)

1 point for guardian.

(Study Session 1, Module 2.1, LOS 2.a)

Question #3 of 104

Question ID: 1430423

Justify your response to the previous answer with *one* reason.

Explanation

Joe's primary concern is avoiding losses, suggesting he has low risk tolerance. Alternatively, Joe is cautious and wants to protect his assets.

Scoring key: (2 points possible)

2 points for a valid reason supporting the classification.

(Study Session 1, Module 2.1, LOS 2.a)

Question #4 of 104

Question ID: 1430424

Explain how Smith would structure a goals-based investment plan for the Finnegans and **state** *one* advantage of such a plan for them.

Explanation

Structure the plan in three layers, one for each priority level of goals. The highest priority goals would be funded with lower risk assets, the lowest priority with higher risk assets, and the middle priority with medium risk assets.

The advantage to the client is to see how high priority goals are less likely to be endangered by market declines and, thus, help the client stick with the investment plan during stressful market periods.

Scoring key: (3 points possible)

1 point for covering the 3 layers and 1 point for the risk characteristics in each layer. 1 point for conveying that the client is more likely to stay with such a plan and, thus, come out ahead in the long run.

(Study Session 1, Module 2.2, LOS 2.d)

Question #5 of 104

Question ID: 1430425

Explain with *one* reason why Smith would deviate from the traditional plan asset allocations. **Explain** with *one* reason why Smith would not deviate from the traditional plan asset allocations. For both reasons, use the information provided regarding the Finnegans.

Explanation

- Deviate because their biases are mainly emotional, and that will make it difficult to convince them to change. Thus, the emotional biases should be accommodated and adapted to.
- Do not deviate extensively from a traditional asset allocation plan because their assets are small enough that meeting their primary goals will be difficult.

Scoring key: (4 points possible)

1 point each for identifying the two relevant pieces of information and 1 point each for why one supports less deviation and the other supports more deviation from a traditional asset allocation plan.

(Study Session 1, Module 1.1, LOS 1.c)

Overview for Questions #6-11 of 104

Question ID: 1431355

TOPIC: PRIVATE WEALTH MANAGEMENT

TOTAL POINT VALUE OF THIS QUESTION SET IS 15 POINTS

Ella and James Cleary are both 30 years old and have been married for three years.

Ella is employed as a nurse in the government-funded public health service industry. A very high demand for healthcare services and a long-term undersupply of nursing staff have been a feature of the public health service for many decades, and this situation is not expected to change. While this brings job stability, the prospects for large future pay raises and bonuses are low. James is an orthodontist who set up independent practice two years ago as a joint venture with two other dental surgeons. The practice is based in a wealthy financial district of the city in which they live and is heavily dependent on the discretionary spending of financial market workers on cosmetic dental surgery. It has been very profitable over the past two years, but James has reinvested profits rather than taken income.

They meet with Remi Garrick, a financial advisor, to discuss their financial goals.

Garrick begins their meeting by questioning the couple about their current circumstances. He collates the following information:

Financial Assets and Liabilities

The Clearys have a combined savings of GBP 40,000 and combined accrued DB government pension plan benefits of GBP 3,000 (split equally). They have combined credit card debt of GBP 4,000 and combined student loan balances of GBP 33,000.

Income and Expenses

The net incomes of Ella and James are currently GBP 20,000 each. Annual living expenses are GBP 35,200, which are incurred equally by James and Ella. Both Ella and James have the intention of retiring when they are 65 years old.

Garrick identifies that the Clearys are rich in human capital but have limited financial assets. Actuarial mortality tables relevant for the Clearys show that the probability of survival to any given age is slightly lower for males than it is for females. Garrick notes that mortality rates are a key input to the estimation of human capital alongside other key inputs such as expected growth in earnings and occupational income volatility.

Garrick recommends the Clearys mitigate their risk to human capital from premature death through purchasing life insurance. He assumes that, upon the death of either spouse:

- Funeral expenses and legal fees would be GBP 10,000.

- An emergency fund of GBP 15,000 should be established to help the surviving spouse deal with unexpected costs.
- The life insurance pay-out should clear any debts of the couple.
- The living expenses of the surviving spouse would grow at 2% until death at age 90, discounted at 3% as an annuity due.
- The human capital of the surviving spouse would be GBP 700,000.

Question #6 of 104

Question ID: 1430502

Based on growth in earnings, how is the value of Ella's human capital *most likely* to compare with James's human capital? (Note: Consider growth in earnings in isolation.)

A) Higher than James. ✗

B) The same as James. ✗

C) Lower than James. ✓

Explanation

Based on growth in earnings, the value of Ella's human capital is most likely *lower* than James's human capital.

Scoring key: (1 point possible)

1 point for correctly selecting lower.

(Study Session 11, Module 23.1, LOS 23.a)

Question #7 of 104

Question ID: 1430503

Justify your response with *one* reason.

Explanation

Based on growth in earnings, the value of Ella's human capital is most likely *lower* than James's human capital. Prospects for large growth in earnings are higher for James as an owner of a rapidly growing business than for Ella, who has job stability but low prospects for future pay raises and bonuses. James's income is likely to grow faster than Ella's, leading to a higher value of human capital.

Scoring key: (2 points possible)

2 points for correctly justifying the response.

(Study Session 11, Module 23.1, LOS 23.a)

Question #8 of 104

Question ID: 1430504

Based on occupational income volatility, how is the value of Ella's human capital *most likely* to compare with James's human capital? (Note: Consider occupational income volatility in isolation.)

A) Higher than James. ✓

B) The same as James. ✗

C) Lower than James. ✗

Explanation

Based on occupational income volatility, the value of Ella's human capital is most likely *higher* than James's human capital.

Scoring key: (1 point possible)

1 point for correctly selecting higher.

(Study Session 11, Module 23.1, LOS 23.a)

Question #9 of 104

Question ID: 1430505

Justify your response to the previous answer with *one* reason.

Explanation

Based on occupational income volatility, the value of Ella's human capital is most likely *higher* than James's human capital. Ella's income is likely to be less volatile because her services are in strong demand. James's business profit will likely be more volatile because it depends on the future health of the financial markets. With higher income volatility, James's further income will be discounted at a higher rate when calculating human capital, meaning that the factor alone causes Ella to have higher human capital.

Scoring key: (2 points possible)

2 points for correctly justifying the response.

(Study Session 11, Module 23.1, LOS 23.a)

Question #10 of 104

Question ID: 1430506

Identify *one* major source of earnings risk that the Clearys face in their current stage of life. For the source of earnings risk identified, **discuss** *one* appropriate method to manage the risk.

Explanation

The candidate could state **either** of the following as sources of earnings risk (note the question only asked for *one* source):

1. **Loss of employment**. Should either Ella or James lose their employment and struggle to find re-employment then they will fail to realize the full value of their human capital. To mitigate this risk the couple could establish a **safety buffer reserve** to act as a source of funds to meet living expenses whilst the unemployed spouse is between jobs.
2. **Serious illness or disability**. Should either Ella or James become seriously ill or disabled this could expose the couple to a shortfall in income and cause them to fail to realize the value of their human capital. The couple could take out **disability insurance** which would replace the lost income in this eventuality.

Scoring key: (3 points possible)

1 point each for correctly naming source of earnings risk. 2 points for correctly identifying a method to mitigate the risk.

(Study Session 11, Module 23.2, LOS 23.e)

Question #11 of 104

Question ID: 1431356

What is the amount of life insurance needed by the Clearys under the needs analysis method?

Explanation

Cash Needs	GBP
Funeral and legal costs	10,000
Emergency fund	15,000
Debts to be repaid:	
Credit cards	4,000
Student loans	33,000
Total Cash Needs	**62,000**
Capital Needs	
PV of surviving spouse's living expenses*	803,336
Less: PV of survivor's income until retirement	–700,000
Total Capital Needs	**103,336**
Total Financial Needs	**165,336**
Capital Available	
Savings	40,000
DB pension attributable to surviving spouse	1,500
Total Capital Available	**41,500**
Life Insurance Needs	**123,836**

*PV of surviving spouse's living expenses calculated as follows:

Growth-adjusted discount rate = (1 + r) / (1 + g) – 1 = (1.03) / (1.02) – 1 = 0.98%

Then PV of growing annuity due is calculated using TVM keys on the calculator in BGN mode as follows:

60 N (surviving spouse expected to live for another 60 years to age 90)

0.98 I/Y (growth adjusted discount rate as derived above)

17,600 PMT (current living expense of one spouse is half the total current living expenses of 35,200)

CPT PV: –803,336

Scoring key: (6 points possible)

6 points total for the correct amount of life insurance. Partial credit can be earned as follows: 0.5 points for including funeral costs. 0.5 points for including emergency fund. 1 point for including debts. 2 points for correctly calculating PV of surviving spouse's expenses. 0.5 points for deducting human capital of surviving spouse. 0.5 points for deducting savings. 0.5 point for deducting DB pension benefits.

(Study Session 11, Module 23.2, LOS 23.e)

Overview for Questions #12-14 of 104

Question ID: 1431350

TOPIC: FIXED INCOME PORTFOLIO MANAGEMENT

TOTAL POINT VALUE OF THIS QUESTION SET IS 9 POINTS

Mark Angeles is a portfolio manager investing in global fixed income markets. He is performing relative value analysis on two bonds, the details of which are displayed in Exhibit 1.

Exhibit 1: Bonds Considered for Relative Value Analysis

Bond	Spread Duration	Yield	z-Spread (bps)	Credit Rating
1	5	4.0%	190	BB–
2	4	3.0%	90	A

Angeles assumes a 30% recovery rate on defaults for the two bonds under analysis. When estimating the average annual probability of default for the bonds over his six-month investment horizon, Angeles uses the output of his firm's proprietary reduced form credit risk model. These probabilities are displayed Exhibit 2.

Exhibit 2: Average Annual Probability of Default

Credit Rating	Average Annual Probability of Default
A+	0.20%
A	0.25%
A–	0.29%
BBB+	0.32%
BBB	0.39%
BBB–	0.59%
BB+	1.05%
BB	1.30%
BB–	2.28%

Angeles consults with his firm's chief economist regarding expected changes in spread. The economist tells Angeles that improving business conditions are likely to see spreads contract by an estimated 20 basis points over the next six months.

Angeles has identified a different bond, Bond 3, which he believes is undervalued based on his assessment that the fair G-spread for this bond is 1.30%. He gathers the relevant information displayed in Exhibit 3.

Exhibit 3: Information Relating to Bond 3 and Relevant Benchmark Bonds

Bond	Price	Yield	Maturity (years)	Effective Duration
Bond 3	101.5	3.42%	5.40	4.40
Treasury Bond A	99.47	2.05%	4.83	4.30

Treasury Bond B	100.25	2.24%	7.35	6.50

Question #12 of 104

Question ID: 1431351

Use the information provided in Exhibits 1 and 2 and assume the economist's forecast is correct over Angeles's investment horizon of six months. **Calculate** the expected excess spread of the bond with the higher expected excess spread (in basis points [bps]).

Explanation

The expected excess spread is calculated using the following formula:

expected excess spread = spread0 – (EffSpreadDur × ΔSpread) – (POD × LGD)

where:

$Spread_0$ = spread at beginning of period

ΔSpread = change in credit spread during holding period

EffSpreadDur = effective spread duration of the bond

POD = annualized expected probability of default

LGD = expected loss given default expressed as a ratio (i.e., loss *severity*)

Note that the investment horizon is six months; hence, the spread and POD need to be multiplied by 0.5 in order to annualize the amounts. An assumed 30% recovery rate on defaults implies a loss severity, LGD = 70%. The economist projects that spreads will contract by 20 basis points; hence, ΔSpread = –0.002.

Values for $Spread_0$ and EffSpreadDur can be taken from Exhibit 1. Using the credit ratings listed in Exhibit 1, the average annual probability of default for Bonds 1 and 2 can be taken from Exhibit 2 as 2.28% and 0.25%, respectively.

Then the expected excess spread of Bonds 1 and 2 are calculated as:

expected excess spread (1) = (0.019 × 0.5) – (–0.002 × 5) – (0.5 × 0.0228 × 0.7) = 0.01152 or 115.2 bps

expected excess spread (2) = (0.009 × 0.5) – (–0.002 × 4) – (0.5 × 0.0025 × 0.7) = 0.01163 or 116.3 bps

Therefore, Bond 2 has the higher expected excess spread.

Scoring key:(4 points possible)

Partial credit can be earned as follows:

- 2 points for correctly calculating each of Bonds 1 and 2 (0.5 point for each part of the calculation and 0.5 point for the final answer).

(Study Session 6, Module 14.2, LOS 14.b)

Question #13 of 104

Question ID: 1430472

Using the information provided in Exhibit 3, based on Angeles' assessment of the fair G-spread of the bond, Bond 3 is:

A) undervalued. ✓

B) fairly valued. ✗

C) overvalued. ✗

Explanation

Bond 3 will be undervalued if its actual G-spread based on the interpolated yields of the two relevant Treasury bonds is higher than the fair G-spread of 1.30% stated by Angeles.

Scoring key: (1 point possible)

1 point for identifying the bond is undervalued.

(Study Session 6, Module 14.2, LOS 14.b)

Question #14 of 104

Question ID: 1430473

Justify your response to the previous answer in the following space.

Explanation

Bond 3 will be undervalued if its actual G-spread based on the interpolated yields of the two relevant Treasury bonds is higher than the fair G-spread of 1.30% stated by Angeles.

Combining a weight in Treasury Bond A (w_1) and a complementary weight (w_2) in Treasury Bond B to give the same maturity as Bond 3, gives:

$(w_1 \times 4.83) + (w_2 \times 7.35) = 5.40$

Note that $w_2 = (1 - w_1)$, hence:

$(w_1 \times 4.83) + ((1 - w_1) \times 7.35) = 5.40$

Solving for w_1 gives:

$4.83w_1 + 7.35 - 7.35w_1 = 5.40$

$-2.52w_1 = -1.95$

So $w_1 = 1.95 / 2.52 = 0.774$ or 77.4% and $w_2 = 22.6\%$

The linearly interpolated yield on the 5.40-year benchmark is:

$(0.774 \times 2.05\%) + (0.226 \times 2.24\%) = 2.09\%$

Hence the G-spread on Bond 3 = 3.42% – 2.09% = 1.33%

Since the actual G-spread (1.33%) is higher than the fair G-spread stated by Angeles (1.30%), the bond is undervalued.

Scoring key: (4 points possible)

1 point for correctly formulating the interpolation of Treasury Bond yields and for correctly calculating w_1. 1 point for calculating the linearly interpolated yield on the benchmark.1 point for calculating the actual G-spread. 1 point for stating the actual G-spread is higher than the G-spread stated by Angeles.

(Study Session 6, Module 14.2, LOS 14.b)

Overview for Questions #15-17 of 104

Question ID: 1431352

TOPIC: FIXED INCOME PORTFOLIO MANAGEMENT

TOTAL POINT VALUE OF THIS QUESTION SET IS 12 POINTS

Mark Angeles goes on to compare two corporate bonds, Bond A and Bond B, in a developing economy. Bond A is rated investment grade while Bond B is rated high yield. The local economy has been in recession in the last year, but Angeles expects the economy to stabilize and an economic recovery to take hold, which will cause risk-free rates to rise. The two bonds have similar analytical durations; however, Angeles concludes that, based on empirical duration, Bond B should be expected to outperform.

Angeles plans to use the credit default swap (CDS) market to profit from his view that the local economy will recover. He collates data regarding two actively traded CDS

index (CDX) contracts on high-yield issuers in the local market displayed in Exhibit 1 below.

Exhibit 1: CDS Index Contracts

Contract	Tenor	Effective Spread Duration	CDS Spread
CDX HY Index	3	2.85	250 bps
CDX HY Index	10	9.65	240 bps

Angeles has limited experience in the use of such CDS contracts and asks a colleague, Stella James, to demonstrate how profits and losses are calculated. James obliges by demonstrating the profit or loss earned on a duration neutral position from selling protection on $1,000,000 notional value in the 10-year CDS and buying the appropriate notional amount of protection in the 3-year CDS.

Question #15 of 104

Question ID: 1430475

Explain why the empirical duration of Bond A is likely to be different than the empirical duration of Bond B. **Evaluate** Angeles's conclusion regarding the relative outperformance of the bonds based on the assessment of the differences in empirical duration between Bond A and Bond B.

Explanation

Bond A is an investment-grade bond and therefore subject to lower default risk and narrow credit spreads. Bond B is a high-yield bond and therefore subject to higher default risk and wider credit spreads. The improvement in the economy should bring about rising risk-free rates, which affects all bond yields, and at the same time credit spreads will narrow. This narrowing of spreads will be more pronounced for high-yield bonds; hence, Bond B's yield is unlikely to rise as much as Bond A's yield. This will lead to a lower empirical duration for Bond B when bond price movements are plotted against risk-free rate movements in order to assess the empirical duration.

In a rising rate environment, Angeles should hold the bond with the lower empirical duration so that the price impact is minimized. Bond B, being a high-yield bond, is likely to have a lower empirical duration than Bond A; hence, Angeles is correct in his conclusion that Bond B is likely to outperform.

Scoring key: (4 points possible)

1 point for correctly explaining that differences in credit rating cause differences in empirical duration. 1 point for explaining why high-yield bonds will have a lower empirical duration.

1 point for explaining that Bond B will have a lower empirical duration than Bond A. 1 point for recommending Bond B due to a lower empirical duration in a rising rate environment.

(Study Session 6, Module 14.1, LOS 14.a)

Question #16 of 104

Question ID: 1431353

State whether James's CDS positioning is consistent with Angeles's view that the economy will recover. **Justify** your answer.

Explanation

James's CDS positioning is *not* consistent with Angeles's view that the economy will recover. In a recovering economy, the credit spread curve is expected to steepen. This is due to the probability of default falling in the near term, causing short-term CDS spreads to fall by more than longer-term CDS spreads. In order to profit from this view, Angeles should sell protection in the 3-year CDX HY index and buy protection in the 10-year CDX HY index. James's CDS positions are not consistent with this view since she has sold protection in the 10-year index and bought protection in the 3-year index.

Scoring key: (3 points possible)

1 point for correctly stating that the positioning is inconsistent with Angeles's view.

1 point for explaining that in an economic recovery the credit curve is expected to steepen.

1 point for correctly stating that in a steepening curve environment, an investor should sell protection in near-dated contracts and buy protection in far-dated contracts.

(Study Session 6, Module 14.5, LOS 14.h)

Question #17 of 104

Question ID: 1430477

Calculate the profit or loss on James's position if 3-year CDX spreads immediately fall by 50 bps and 10-year spreads fall by 30 bps.

Explanation

In order to be duration neutral, the BPV of the $1,000,000 notional value of protection sold on the 10-year index must match the BPV of the protection bought in the 3-year contract.

The BPV of the $1,000,000 notional value of protection sold on the 10-year index is equal to its effective spread duration multiplied by the notional value as follows:

$BPV_{10\text{-year}} = 9.65 \times \$1{,}000{,}000 = \$9{,}650{,}000$

To ensure that the BPV of the 3-year index is the same size, we require:

$\$9{,}650{,}000 = 2.85 \times Notional_{3\text{-year}}$

This implies the appropriate notional value in the 3-year index = $9,650,000 / 2.85 = $3,385,965.

The absolute profit/loss on each contract is calculated as ΔCDS spread × Effective spread duration × Notional amount. Given that spreads are falling, there will be profits from selling protection in the 10-year contract and losses from buying protection in the 3-year contract.

Loss in the 3-year contract = (50 / 10,000) × 2.85 × $3,385,965 = $48,250

Profit in the 10-year contract = (30 / 10,000) × 9.65 × $1,000,000 = $28,950

Hence, net loss = –$48,250 + $28,950 = –$19,300.

Scoring key: (5 points possible)

1 point for correctly calculating the 10-year BPV. 1 point for correctly calculating the notional value in the 3-year contract.

1 point for correctly calculating the profit/loss from each contract (maximum 2 points total). 1 point for correctly calculating the net loss.

(Study Session 6, Module 14.5, LOS 14.h)

Overview for Questions #18-24 of 104

Question ID: 1430512

TOPIC: PORTFOLIO MANAGEMENT FOR INSTITUTIONAL INVESTORS

TOTAL POINT VALUE OF THIS QUESTION SET IS 17 POINTS

The Industrial and Commercial Bank (ICB) is a large global bank. The asset/liability management committee ("ALMCo") of ICB has recently performed an annual review of the performance of the bank. The following two goals were set at the meeting:

Goal 1:	Lowering the liquidity requirements of the investment portfolio of the bank
Goal 2:	Lowering the regulatory capital requirements of the bank

The ALMCo considers increasing exposure to credit risk by selling actively traded investment grade mortgage backed securities and using the proceeds to make loans with similar average maturity to smaller companies. These corporate loans do not have an active securitization market.