Review

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Avg Time Per Question

Your Answers:

Vignette

Olivinia is an oil-rich state in the country of Puerto Rinaldo, which uses the US dollar as its official currency of exchange. In 1981, the state's legislature created the Olivinia Heritage Fund (OHF) to collect a portion of the state's non-renewable resource revenue and invest it on behalf of future generations. James Lafferty, the managing director of the fund, is one of the keynote speakers at the Global Wealth Creation Conference. He begins his presentation with a brief overview of OHF's history (Exhibit 1).

Exhibit 1 An Overview of the Olivinia Heritage Fund

Phase 1 (1981–1991)

- The fund was given an initial allocation of $1 billion by the state. The fund was to receive 10% of all state revenues arising from taxes on oil and gas production and extraction. The fund was given a 20-year accumulation period over which no distributions were allowed and the fund was forecasted to grow to $10 billion. Income earned following the accumulation period was to be used to provide for public works and other public infrastructure within the state. Investments were restricted to cash and investment-grade bonds.

Phase 2 (1991–2001)

- By 1991, after being in existence for 10 years, the fund value had grown to $2.2 billion. At this time, transfers of state revenues from taxes on oil-related resources was halted and the government began to use income generated by the fund for direct economic development and social investment purposes. In addition to cash and investment-grade bonds, the investment mandate for the fund was expanded to include investments in private and public companies, real estate, and infrastructure investments. Management of cash and bond investments was performed in-house. For the higher-risk component of the portfolio, the fund hired external managers in an effort to increase return and correspondingly lower the incidence of negative performance. These managers were hired or retained if they had outperformed other active managers in their sectors in at least the prior two years. The fund value at the end of this period was $6 billion.

Phase 3 (2001–2014)

- Strong reform legislation related to the original intent of the fund was introduced in 2001. It reinstated transfers of oil-related taxes to the fund, increasing them to 35% of oil- and gas-related state revenues. In addition, the fund was mandated to have 50% in public equities through passive index funds and 10% in cash and investment-grade bonds. The remainder was to be divided equally between high-yield bonds, real estate, private equity, and hedge funds and would continue to be managed externally. All investments were to be made outside the country to avoid overheating the national economy. Investments managed by individual external managers was limited to approximately $75 million. A two-thirds majority in both the upper and lower legislative bodies was required to change any future legislation related to the fund. By the end of this phase, the fund was worth $28 billion.

Phase 4 (2014–Present)

- The fund's management felt that the significant decline in oil prices since mid-2014 and lowered production levels were likely to persist through several business cycles, requiring a change in strategy to maintain the long-term objectives of the funds. They sought government approval for lower withdrawals from the fund, higher equity exposure, and the flexibility to vary asset class policy weights by as much ±5% for each asset class from the static weights that had previously

existed. The government reaffirmed its commitment to the fund given in Phase 3, and legislative approval was received for these changes, including the ability to increase public equity exposure to 65% and reduce investment-grade bond exposure to as little as 7.5%. Of the remaining authorized assets, no one asset class could have a weight in excess of 10%.

Lafferty states that ever since the fund was given the authority to vary asset class policy weights from their strategic levels, it has actively engaged in tactical asset allocation (TAA) using a variety of proprietary short-term forecasting tools that have been developed in-house. He provides the data in Exhibits 2 and 3 to illustrate the results of one such shift in the fund's asset allocation following a signal from its TAA model.

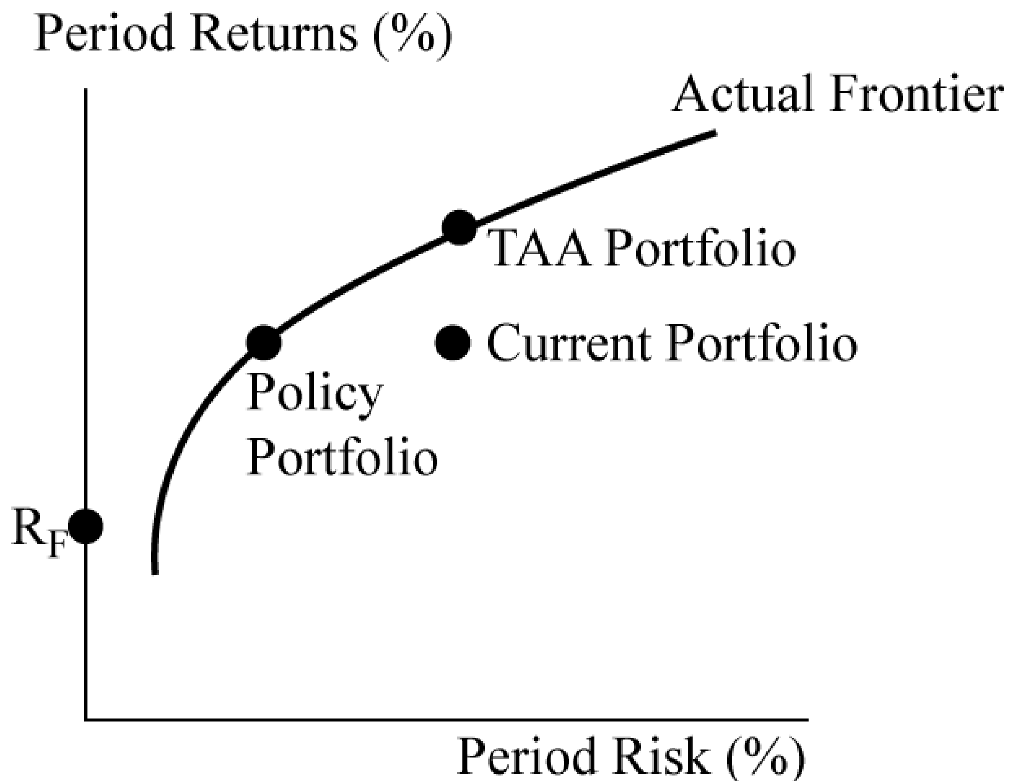
Exhibit 2 Example of a Short-Term Shift in Asset Allocation

Asset Class	Current Weights*	Policy Weights	TAA Weights	Period Returns
Investment-grade bonds	12%	15%	10%	1.75%
High-yield bonds	8	6.25	10	3.0
Public equity	63	60	65	7.0
Private equity	5	6.25	6.25	4.5
Real estate	6.25	6.25	2.5	–4.0
Infrastructure	6.25	6.25	6.25	2.5

* Current weight refers to the weighting in effect just prior to when the TAA signal occurred.

Lafferty concludes the morning portion of his presentation at the conference by comparing the relative performance of the three portfolios (from Exhibit 2) utilizing a graph (Exhibit 3) of the efficient frontier derived from the asset classes used by the fund.

Exhibit 3 Efficient Frontier from Assets Utilized by OHF



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1 Multiple Choice 0 / 1 point

During Phase 1, the *most* significant constraint on OHF's asset allocation choices was the result of:

A. asset size.

B. regulation.

C. liquidity needs.

✕ (no answer)

Correct Answer: **B. regulation.**

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2 Multiple Choice 0 / 1 point

During Phase 2, OHF's external manager selection and retention policy was *most likely* susceptible to which of the following biases?

A. Endowment bias

B. Loss aversion bias

C. Representative bias

✕ (no answer)

Correct Answer: **C. Representative bias**

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3 Multiple Choice 0 / 1 point

In Phase 3, the *most likely* change in the constraints facing OHF's ability to undertake asset allocation arose from an increased need for:

A. liquidity.

B. risk reduction.

C. governance resources.

✕ (no answer)

Correct Answer: **C. governance resources.**

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4 Multiple Choice 0 / 1 point

The changes that were allowed in OHF's strategic asset allocation in Phase 4 are *best* classified as relating to changes in:

A. goals.

B. beliefs.

C. constraints.

✕ (no answer)

Correct Answer: **B. beliefs.**

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5 Multiple Choice 0 / 1 point

Based on Exhibit 2, compared with the strategic asset allocation, the incremental return added to the fund through tactical asset allocation was *closest* to:

A. 0.13%.

B. 0.39%.

C. 0.53%.

✕ (no answer)

Correct Answer: **C. 0.53%.**

6 Multiple Choice 0 / 1 point

The *most* appropriate conclusion that can be drawn from Exhibit 3 is that:

A. the current portfolio is a corner portfolio.

B. the Sharpe ratios for the policy portfolio and the TAA portfolio are the same.

C. management's risk–return objectives may not have been achieved with the TAA portfolio.

(no answer)

Correct Answer: **C. management's risk–return objectives may not have been achieved with the TAA portfolio.**

Vignette

Eunice Fox is head of Strategic Asset Allocation at Windsong Wealth Management, Inc. (WWM). WWM's clients include pension funds, foundations, sovereign funds, high-net-worth individuals, and family trusts. Fox is in the process of hiring an asset allocation analyst and has just completed interviewing two candidates, Ambrose Kelly and Catherine Trainor, for the position. The interviews were directed around the case study of Jane Lennon, a fictitious client, described in Exhibit 1. Fox reviews her interview notes.

Exhibit 1 Case Study of Jane Lennon

Name	Jane Lennon
Occupation and Family Structure	• She is the morning news anchor for a national broadcasting company, where she has worked for the past 20 years. • She is 56 years of age, divorced, and the sole supporter of her two children, Everett, aged 18, and Marshall, aged 14. • Marshall suffers from severe medical and developmental issues.
Current and Expected Future Employment Income	• She currently earns $1 million per year as a broadcaster. • She plans on retiring in four years. With typical raises in her industry, she estimates that the present value of her pre-retirement income is $4.5 million.
Financial Assets and Liabilities	• She has an investment portfolio worth $8 million, which consists of 30% equities and the remainder in fixed-income securities. She also owns $1 million in shares of the broadcasting company she works for, but she is restricted from selling them for two more years. • Her primary residence carries no mortgage and was recently valued at $2 million. She also owns a vacation property worth $3 million, with an outstanding mortgage of $1 million. • Her defined-contribution pension plan has vested and is valued at $2.5 million.
Aspirational Goals and Extended Liabilities	• Everett is just beginning university and plans to pursue a medical degree. Lennon plans on paying for his entire education and living expenses as well as providing some assistance in funding his future practice. She believes that these goals will be covered with $1.5 million in present value terms. • She has begun the process of setting up a special needs trust to provide lifetime benefits for Marshall that will not interfere with the government benefits that he is eligible to receive. It will be funded with $2 million within the year. • She recently received an honorary doctorate from her alma mater and has started the process of endowing a chair in its communications department. She anticipates that the funding will be made available to the university in two years; it has a present value of $1.75 million. • The present value of future consumption is estimated to be $9 million.
Risk Tolerance	• In the past, she has had a tendency to sell winning investments to avoid the risk of giving back gains. She also has had a tendency to retain losing investments even when there is little

	chance of them recovering in value.

Fox told the candidates to assume that Lennon would use sub-portfolios to achieve her aspirational goals and asked them to identify which of the sub-portfolios is in the best position to tolerate the greatest risk exposure.

In reviewing Lennon's risk tolerance, Fox pointed out that Lennon's prior investment experience clearly indicates some behavioral biases that would influence her reaction to any asset allocation proposals.
Fox reminded the candidates that in addition to high-net-worth individuals, the firm's client base also includes various institutional investors. The candidates made the following statements:

Trainor: A goals-based approach to asset allocation is appropriate for individual investors, but institutions need to focus either on the asset or liability side of the balance sheet, depending on the nature of their business.

Kelly: A typical objective of some institutions is to maximize their Sharpe ratio for an acceptable level of volatility, and they rely on the law of large numbers to assist them in modeling their liabilities. Other institutions behave much like individuals by segmenting general account assets into sub-portfolios associated with specific lines of business with their individual return objectives.

Fox mentioned to the candidates that when dealing with strategic asset allocation, investors often had difficulty understanding the relevant characteristics of asset classes. They responded:

Kelly: I like to stress to clients that asset classes should have high within-group correlations but low correlations with other classes. In addition, because investors need to rebalance to a strategic asset allocation, asset classes need to have both sufficient liquidity and low transaction costs.

Trainor: It is important that asset classes should be diversifying. I always look for low pairwise correlations with other asset classes.

Other general comments were noted about asset classes, but Fox could not recall their sources:

- Emerging market equities should not be considered a separate asset class from global equities.
- Asset classes differ from strategies in offering a non–skill-based ex ante expected return premium.
- Asset classes should be defined in such a way that there is no overlap in sources of risk.

7 Multiple Choice 0 / 1 point

The behavioral bias that Lennon's past investment experience illustrates is *best* described as:

A. self-control bias.

B. loss-aversion bias.

C. mental accounting bias.

✕ (no answer)

Correct Answer: **B. loss-aversion bias.**

Vignette

Elsbeth Quinn and Dean McCall are partners at Camel Asset Management (CAM). Quinn advises high-net-worth individuals, and McCall specializes in retirement plans for institutions.

Quinn meets with Neal and Karina Martin, both age 44. The Martins plan to retire at age 62. Twenty percent of the Martins' $600,000 in financial assets is held in cash and earmarked for funding their daughter Lara's university studies, which begin in one year. Lara's education and their own retirement are the Martins' highest-priority goals. Last week, the Martins learned that Lara was awarded a four-year full scholarship for university. Quinn reviews how the scholarship might affect the Martins' asset allocation strategy.

The Martins have assets in both taxable and tax-deferred accounts. For baseline retirement needs, Quinn recommends that the Martins maintain their current overall 60% equity/40% bonds (± 8% rebalancing range) strategic asset allocation. Quinn calculates that given current financial assets and expected future earnings, the

Martins could reduce future retirement savings by 15% and still comfortably retire at 62. The Martins wish to allocate that 15% to a sub-portfolio with the goal of making a charitable gift to their alma mater from their estate. Although the gift is a low-priority goal, the Martins want the sub-portfolio to earn the highest return possible. Quinn promises to recommend an asset allocation strategy for the Martins' aspirational goal.

Next, Quinn discusses taxation of investments with the Martins. Their interest income is taxed at 35%, and capital gains and dividends are taxed at 20%. The Martins want to minimize taxes. Based on personal research, Neal makes the following two statements:

- **Statement 1:** The after-tax return volatility of assets held in taxable accounts will be less than the pre-tax return volatility.
- **Statement 2:** Assets that receive more favorable tax treatment should be held in tax-deferred accounts.

The equity portion of the Martins' portfolios produced an annualized return of 20% for the past three years. As a result, the Martins' equity allocation in both their taxable and tax-deferred portfolios has increased to 71%, with bonds falling to 29%. The Martins want to keep the strategic asset allocation risk levels the same in both types of retirement portfolios. Quinn discusses rebalancing; however, Neal is somewhat reluctant to take money out of stocks, expressing confidence that strong investment returns will continue.

Quinn's CAM associate, McCall, meets with Bruno Snead, the director of the Katt Company Pension Fund (KCPF). The strategic asset allocation for the fund is 65% stocks/35% bonds. Because of favorable returns during the past eight recession-free years, the KCPF is now overfunded. However, there are early signs of the economy weakening. Since Katt Company is in a cyclical industry, the Pension Committee is concerned about future market and economic risk and fears that the high-priority goal of maintaining a fully funded status may be adversely affected. McCall suggests to Snead that the KCPF might benefit from an updated IPS. Following a thorough review, McCall recommends a new IPS and strategic asset allocation.

The proposed IPS revisions include a plan for short-term deviations from strategic asset allocation targets. The goal is to benefit from equity market trends by automatically increasing (decreasing) the allocation to equities by 5% whenever the S&P 500 Index 50-day moving average crosses above (below) the 200-day moving average.

8 Multiple Choice 0 / 1 point

Given the change in funding of Lara's education, the Martins' strategic asset allocation would *most likely* decrease exposure to:

A. cash.

B. bonds.

C. equities.

× (no answer)

Correct Answer: **A. cash.**

Feedback

General feedback

A is correct. The changing character of liabilities through time affects the asset allocation to fund those liabilities. The Martins' investment horizon for some of their assets has changed. The amount of liquidity needed for Lara's near-term education has been greatly reduced owing to the receipt of the scholarship. The Martins will likely still have to pay for some university-related expenses; however, a large part of the $120,000 in cash that is earmarked for Lara's expenses can now be allocated to the Martins' long-term goal of early retirement. Retirement is 18 years away, much longer than the one- to five-year horizon for university expenses. Therefore, the Martins' allocation to cash would likely decrease.

9 Multiple Choice 0 / 1 point

The *most* appropriate asset allocation for the Martins' new charitable gift sub-portfolio is:

A. 40% equities/60% bonds.

B. 70% equities/30% bonds.

C. 100% equities/0% bonds.

× (no answer)

Correct Answer: **C. 100% equities/0% bonds.**

Feedback

General feedback

C is correct. The Martins' sub-portfolio is aspirational and a low priority. Investors are usually willing to take more risk on lower-priority, aspirational portfolios. The charitable gift will be made from their estate, which indicates a long time horizon. In addition, the Martins want the highest return possible. Therefore, the highest allocation to equities is most appropriate.

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10 Multiple Choice 0 / 1 point

Which of Neal's statements regarding the taxation of investments is correct?

A. Statement 1 only

B. Statement 2 only

C. Both Statement 1 and Statement 2

× (no answer)

Correct Answer: **A. Statement 1 only**

Feedback

General feedback

A is correct. Taxes alter the distribution of returns by both reducing the expected mean return and muting the dispersion of returns. The portion of an owner's taxable assets that are eligible for lower tax rates and deferred capital gains tax treatment should first be allocated to the investor's taxable accounts.

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11 Multiple Choice 0 / 1 point

Given the Martins' risk and tax preferences, the taxable portfolio should be rebalanced:

A. less often than the tax-deferred portfolio.

B. as often as the tax-deferred portfolio.

C. more often than the tax-deferred portfolio.

× (no answer)

Correct Answer: **A. less often than the tax-deferred portfolio.**

Feedback

General feedback

A is correct. The Martins wish to maintain the same risk level for both retirement accounts based on their strategic asset allocation. However, more frequent rebalancing exposes the taxable asset owner to realized taxes that could have otherwise been deferred or even avoided. Rebalancing is discretionary, and the Martins' also wish to minimize taxes. Because after-tax return volatility is lower than pre-tax return volatility, it takes larger asset-class movements to materially alter the risk profile of a taxable portfolio. This suggests that rebalancing ranges for a taxable portfolio can be wider than those of a tax-exempt/tax-deferred portfolio with a similar risk profile; thus, rebalancing occurs less frequently.

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12 Multiple Choice 0 / 1 point

During the rebalancing discussion, which behavioral bias does Neal exhibit?

- A. Framing bias
- B. Loss aversion
- C. Representativeness bias

✕ (no answer)

Correct Answer: **C. Representativeness bias**

Feedback

General feedback

C is correct. Representativeness, or recency, bias is the tendency to overweight the importance of the most recent observations and information relative to a longer-dated or more comprehensive set of long-term observations and information. Return chasing is a common result of this bias, and it results in overweighting asset classes with strong recent performance.

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13 Multiple Choice 0 / 1 point

Given McCall's IPS recommendation, the *most* appropriate new strategic asset allocation for the KCPF is:

- A. 40% stocks/60% bonds.
- B. 65% stocks/35% bonds.
- C. 75% stocks/25% bonds.

✕ (no answer)

Correct Answer: **A. 40% stocks/60% bonds.**

Feedback

General feedback

A is correct. McCall recommends a new IPS. Changes in the economic environment and capital market expectations or changes in the beliefs of committee members are factors that may lead to an altering of the principles that guide investment activities. Because the plan is now overfunded, there is less need to take a higher level of equity risk. The Pension Committee is concerned about the impact of future market and economic risks on the funding status of the plan. Katt Company operates in a cyclical industry and could have difficulty making pension contributions during a recession. Therefore, a substantial reduction in the allocation to stocks and an increase in bonds reduce risk. The 40%

stocks/60% bonds alternative increases the allocation to bonds from 35% to 60%. Increasing the fixed-income allocation should moderate plan risk, provide a better hedge for liabilities, and reduce contribution uncertainty.

14 Multiple Choice 0 / 1 point

The proposal for short-term adjustments to the KCPF asset allocation strategy is known as:

A. de-risking.

B. systematic tactical asset allocation.

C. discretionary tactical asset allocation.

(no answer)

Correct Answer: **B. systematic tactical asset allocation.**

Feedback

General feedback

B is correct. Using rules-based, quantitative signals, systematic tactical asset allocation (TAA) attempts to capture asset-class-level return anomalies that have been shown to have some predictability and persistence. Trend signals are widely used in systematic TAA. A moving-average crossover is a trend signal that indicates an upward (downward) trend when the moving average of the shorter time frame, 50 days, is above (below) the moving average of the longer time frame, 200 days.

Vignette

Rebecca Mayer is an asset management consultant for institutions and high-net-worth individuals. Mayer meets with Sebastian Capara, the newly appointed Investment Committee chairman for the Kinkardeen University Endowment (KUE), a very large tax-exempt fund.

Capara and Mayer review KUE's current and strategic asset allocations, which are presented in Exhibit 1. Capara informs Mayer that over the last few years, Kinkardeen University has financed its operations primarily from tuition, with minimal need of financial support from KUE. Enrollment at the University has been rising in recent years, and the Board of Trustees expects enrollment growth to continue for the next five years. Consequently, the board expects very modest endowment support to be needed during that time. These expectations led the Investment Committee to approve a decrease in the endowment's annual spending rate starting in the next fiscal year.

Exhibit 1
Kinkardeen University Endowment—Strategic Asset Allocation Policy

Asset Class	Current Weight	Target Allocation	Lower Policy Limit	Upper Policy Limit
Developed markets equity	30%	30%	25%	35%

Emerging markets equity	28%	30%	25%	35%
Investment-grade bonds	15%	20%	15%	25%
Private real estate equity	15%	10%	5%	15%
Infrastructure	12%	10%	5%	15%

As an additional source of alpha, Mayer proposes tactically adjusting KUE's asset-class weights to profit from short-term return opportunities. To confirm his understanding of tactical asset allocation (TAA), Capara tells Mayer the following:

- **Statement 1:** The Sharpe ratio is suitable for measuring the success of TAA relative to SAA.
- **Statement 2:** Discretionary TAA attempts to capture asset-class-level return anomalies that have been shown to have some predictability and persistence.
- **Statement 3:** TAA allows a manager to deviate from the IPS asset-class upper and lower limits if the shift is expected to produce higher expected risk-adjusted returns.

Capara asks Mayer to recommend a TAA strategy based on excess return forecasts for the asset classes in KUE's portfolio, as shown in Exhibit 2.

Exhibit 2
Short-Term Excess Return Forecast

Asset Class	Expected Excess Return
Developed markets equity	2%
Emerging markets equity	5%
Investment-grade bonds	–3%
Private real estate equity	3%
Infrastructure	–1%

Following her consultation with Capara, Mayer meets with Roger Koval, a member of a wealthy family. Although Koval's baseline needs are secured by a family trust, Koval has a personal portfolio to fund his lifestyle goals.

In Koval's country, interest income is taxed at progressively higher income tax rates. Dividend income and long-term capital gains are taxed at lower tax rates relative to interest and earned income. In taxable accounts, realized capital losses can be used to offset current or future realized capital gains. Koval is in a high tax bracket, and his taxable account currently holds, in equal weights, high-yield bonds, investment-grade bonds, and domestic equities focused on long-term capital gains.

Koval asks Mayer about adding new asset classes to the taxable portfolio. Mayer suggests emerging markets equity given its positive short-term excess return forecast. However, Koval tells Mayer he is not interested in adding emerging markets equity to the account because he is convinced it is too risky. Koval justifies this belief by referring to significant losses the family trust suffered during the recent economic crisis.

Mayer also suggests using two mean–variance portfolio optimization scenarios for the taxable account to evaluate potential asset allocations. Mayer recommends running two optimizations: one on a pre-tax basis and another on an after-tax basis.

15 Multiple Choice 0 / 1 point

The change in the annual spending rate, in conjunction with the board's expectations regarding future enrollment and the need for endowment support, could justify that KUE's target weight for:

A. infrastructure be increased.

B. investment-grade bonds be increased.

C. private real estate equity be decreased.

✕ (no answer)

Correct Answer: **A. infrastructure be increased.**

Feedback

General feedback

A is correct. A lower annual spending rate, in addition to the board's expectations of rising enrollment and minimal need for endowment support over the next five years, indicates a decreased need for liquidity. Therefore, KUE could justify an increase in the strategic allocation to less liquid asset classes (such as private real estate equity and infrastructure) and a decrease in the strategic allocation to liquid assets (such as investment-grade bonds).

16 Multiple Choice 0 / 1 point

Which of Capara's statements regarding tactical asset allocation is correct?

A. Statement 1

B. Statement 2

C. Statement 3

✕ (no answer)

Correct Answer: **A. Statement 1**

Feedback

General feedback

A is correct. The Sharpe ratio is suitable for measuring the success of TAA relative to SAA. Specifically, the success of TAA decisions can be evaluated by comparing the Sharpe ratio realized under the TAA with the Sharpe ratio that would have been realized under the SAA.

17 Multiple Choice 0 / 1 point

Based on Exhibits 1 and 2, to attempt to profit from the short-term excess return forecast, Capara should increase KUE's portfolio allocation to:

A. developed markets equity and decrease its allocation to infrastructure.

B. emerging markets equity and decrease its allocation to investment-grade bonds.

C. developed markets equity and increase its allocation to private real estate equity.

✕ (no answer)

Correct Answer: **A. developed markets equity and decrease its allocation to infrastructure.**

Feedback

General feedback

A is correct. The forecast for expected excess returns is positive for developed markets equity and negative for infrastructure. Therefore, to attempt to profit from the short-term excess return forecast, KUE can overweight developed markets equity and underweight infrastructure. These adjustments to the asset-class weights are within KUE's lower and upper policy limits.

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18 Multiple Choice 0 / 1 point

Given Koval's current portfolio and the tax laws of the country in which he lives, Koval's portfolio would be more tax efficient if he reallocated his taxable account to hold more:

A. high-yield bonds.

B. investment-grade bonds.

C. domestic equities focused on long-term capital gain opportunities.

✕ (no answer)

Correct Answer: **C. domestic equities focused on long-term capital gain opportunities.**

Feedback

General feedback

C is correct. As a general rule, the portion of a taxable asset owner's assets that are eligible for lower tax rates and deferred capital gains tax treatment should first be allocated to the investor's taxable accounts. Assets that generate returns mainly from interest income tend to be less tax efficient and in Koval's country are taxed at progressively higher rates. Also, the standard deviation (volatility) of after-tax returns is lower when equities are held in a taxable account. Therefore, Koval's taxable account would become more tax efficient if it held more domestic equities focused on long-term capital gain opportunities.

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19 Multiple Choice 0 / 1 point

Koval's attitude toward emerging markets equity reflects which of the following behavioral biases?

A. Hindsight bias

B. Availability bias

C. Illusion of control

✕ (no answer)

Correct Answer: **B. Availability bias**

Feedback

General feedback

B is correct. Availability bias is an information-processing bias in which people take a mental shortcut when estimating the probability of an outcome based on how easily the outcome comes to mind. On the basis of the losses incurred by his family trust during the recent economic crisis, Koval expresses a strong preference for avoiding the emerging markets equity asset class. Such behavior is consistent with availability bias, where investors who personally experience an adverse event are likely to assign a higher probability to such an event occurring again.

20 Multiple Choice 0 / 1 point

In both of Mayer's optimization scenarios, which of the following model inputs could be used without adjustment?

- A. Expected returns
- B. Correlation of returns
- C. Standard deviations of returns

× (no answer)

Correct Answer: **B. Correlation of returns**

Feedback

General feedback

B is correct. After-tax portfolio optimization requires adjusting each asset class's expected return and risk for expected taxes. The correlation of returns is not affected by taxes and does not require an adjustment when performing after-tax portfolio optimization.

Vignette

Emma Young, a 47-year-old single mother of two daughters, ages 7 and 10, recently sold a business for $5.5 million net of taxes and put the proceeds into a money market account. Her other assets include a tax-deferred retirement account worth $3.0 million, a $500,000 after-tax account designated for her daughters' education, a $400,000 after-tax account for unexpected needs, and her home, which she owns outright.

Her living expenses are fully covered by her job. Young wants to retire in 15 years and to fund her retirement from existing assets. An orphan at eight who experienced childhood financial hardships, she places a high priority on retirement security and wants to avoid losing money in any of her three accounts.

21 Essay 0 / 1 point

Identify the behavioral biases (e.g., loss aversion, illusion of control, mental accounting, representative bias, framing bias, and availability bias) Young is *most likely* exhibiting. **Justify** each response.

Bias	Justification
Loss Aversion	
Illusion of Control	
Mental Accounting	
Representative Bias	
Framing Bias	
Availability Bias	

(response not displayed)

Feedback

General feedback

Of the six potential behavioral biases, Young is most likely exhibiting three as explained below.

Identify the behavioral biases Young is *most likely* exhibiting. (Choose the correct answers.)

Justify each response.

Bias	Justification
Loss Aversion	Under loss-aversion bias, people strongly prefer avoiding losses as opposed to achieving gains and they assign a greater weight to potential negative outcomes than positive ones. Young's strong emphasis on retirement security and her desire to avoid losing money indicates that she has a loss-aversion bias. This bias could interfere with her willingness to maintain ideal asset allocations during times of negative returns.
Illusion of Control	
Mental Accounting	Under mental accounting bias, people treat one sum of money differently from another sum based solely on the mental account to which the money is assigned. Young is considering her $3 million tax-deferred retirement account, her $500,000 account for the girls' education, and the $400,000 emergency account separately, rather than seeing them all as a combined investable total. In doing this, she sets herself up for the possibility of sub-optimal allocation.
Representative Bias	
Framing Bias	
Availability Bias	Under availability bias, people take a mental shortcut when estimating the probability of an outcome based on how easily the outcome comes to mind. Easily recalled outcomes are often perceived as being more likely than those that are harder to recall or understand. Young's strong emphasis on retirement security and her desire to avoid losing money both could be driven by her strong memories of her childhood financial hardships.

22 Essay 0 / 1 point

A broker proposes to Young three portfolios, shown in Exhibit 1. The broker also provides Young with asset class estimated returns and portfolio standard deviations in Exhibit 2 and Exhibit 3, respectively. The broker notes that there is a $500,000 minimum investment requirement for alternative assets. Finally, because the funds in the money market account are readily investible, the broker suggests using that account only for this initial investment round.

Exhibit 1
Proposed Portfolios

Asset Class	Portfolio 1	Portfolio 2	Portfolio 3
Municipal Bonds	5%	35%	30%
Small-Cap Equities	50%	10%	35%
Large-Cap Equities	35%	50%	35%
Private Equity	10%	5%	0%
Total	100%	100%	100%

Exhibit 2
Asset Class Pre-Tax Returns

Asset Class	Pre-Tax Return
Municipal Bonds	3%
Small-Cap Equities	12%
Large-Cap Equities	10%
Private Equity	25%

Exhibit 3
Portfolio Standard Deviations

Proposed Portfolio	Post-Tax Standard Deviation
Portfolio 1	28.2%
Portfolio 2	16.3%
Portfolio 3	15.5%

Young wants to earn at least 6.0% after tax per year, without taking on additional incremental risk. Young's capital gains and overall tax rate is 25%.

Determine which proposed portfolio *most closely* meets Young's desired objectives. **Justify** your response.

Portfolio 1	Portfolio 2	Portfolio 3

(response not displayed)

Feedback

General feedback

Determine which proposed portfolio *most closely* meets Young's desired objectives. (Choose one.)

Portfolio 1	Portfolio 2	Portfolio 3

Justify your response.

Portfolio 3 comes closest to meeting Young's desire to earn at least 6% after tax per year without taking on additional incremental risk. Portfolio 3 offers a lower standard deviation than Portfolio 2, as summarized in Exhibit 3, while producing approximately the same return. Portfolio 1 achieves the highest returns but at a much greater level of volatility than Portfolio 3, not satisfying Young's risk criterion.

Given the $500,000 minimum investment requirement for alternative assets, at Young's total portfolio size of $5.5 million, the suggested 5% allocation to private equity in Portfolio 2 results in only a $275,000 exposure, insufficient to invest in private equity. Thus, Portfolio 2, as presented, is not viable, whereas Portfolio 1, with a private equity investment of $550,000, meets the minimum requirement for alternative investments. This minimum investment requirement is not an issue for Portfolio 3 because it has no private equity component.

Asset Class	Portfolio 3	Pre-Tax Return	Post-Tax Return	Resulting Return
Municipal Bonds	30%	3%	3.00%	0.90%
Small-Cap Equities	35%	12%	9.00%	3.15%
Large-Cap Equities	35%	10%	7.50%	2.63%
Private Equity	0%	25%	18.75%	0.00%
Total	100%			6.68%

23 Essay 0 / 1 point

The broker suggests that Young rebalance her $5.5 million money market account and the $3.0 million tax-deferred retirement account periodically in order to maintain their targeted allocations. The broker proposes the same risk profile for the equity positions with two potential target equity allocations and rebalancing ranges for the two accounts as follows:

- Alternative 1: 80% equities +/– 8.0% rebalancing range
- Alternative 2: 75% equities +/– 10.7% rebalancing range

Determine which alternative *best* fits each account. **Justify** each selection.

Account	Alternative	Justify each selection.
$5.5 Million Account	Alternative 1 Alternative 2	
$3.0 Million Account	Alternative 1 Alternative 2	

(response not displayed)

Feedback

General feedback

Determine which alternative (choose one) *best* fits each account.

<table>
<tr><th>Account</th><th>Alternative</th><th>Justify each selection.</th></tr>
<tr><td rowspan="2">$5.5 Million Account</td><td>Alternative 1</td><td rowspan="2">The $5.5 million account is after tax. Because after-tax volatility is lower than pre-tax volatility, the rebalancing range for an after-tax account is wider. The range reflected for Alternative 2 is 10.7%, whereas the range for Alternative 1 is 8.0% (to achieve the same risk constraint), reflecting the impact of taxes on the $5.5 million account.

In addition, asset sales in the after-tax account result in taxes due. A wider target range allows more price movement before the rebalancing range is exceeded (and a decision must be made to initiate an asset sale, incur associated tax payments, and rebalance back to the target equity allocation).

The after-tax account range is calculated by adjusting the pre-tax range for taxes.

After-tax rebalancing range = Pre-tax rebalancing range/(1 – Tax rate).

8.0%/(1 – 0.25)

10.67%</td></tr>
<tr><td>Alternative 2</td></tr>
<tr><td rowspan="2">$3.0 Million Account</td><td>Alternative 1</td><td rowspan="2">The $3.0 million is a tax-deferred retirement account. Because pre-tax volatility is higher than after-tax volatility, the rebalancing range for a pre-tax account is narrower. The range reflected for Alternative 1 is 8.0%, whereas the range for Alternative 2 is 10.7% (to achieve the same risk constraint), reflecting the impact of tax deferral on the $3.0 million account versus the effect of taxes on the $5.5 million account.</td></tr>
<tr><td>Alternative 2</td></tr>
</table>

24 Essay 0 / 1 point

Ten years later, Young is considering an early-retirement package offer. The package would provide continuing salary and benefits for three years. The broker recommends a special review of Young's financial plan to assess potential changes to the existing allocation strategy.

Identify the *primary* reason for the broker's reassessment of Young's circumstances. **Justify** your response.

Change in goals	Change in constraints	Change in beliefs

(response not displayed)

Feedback

General feedback

Identify the *primary* reason for the broker's reassessment of Young's circumstances. (Choose one.)

Change in goals	Change in constraints	Change in beliefs

Justify your response.

A change in constraints relates to material changes in constraints, such as time horizon, liquidity needs, asset size, and regulatory or other external constraints. In this case, Young's circumstances have changed; she is considering accepting the offer and retiring five years sooner than she originally anticipated.

A change in an investor's personal circumstances that may alter her risk appetite or risk capacity is considered to be a change in *goals*. In this circumstance, Young's risk appetite or risk capacity have not changed, whereas the time horizon associated with her goals has.

A change in the investment beliefs or principles guiding an investor's investment activities is considered to be a change in *beliefs*. In this circumstance, Young's guiding principles have not changed.

Young decides to accept the retirement offer. Having very low liquidity needs, she wants to save part of the retirement payout for unforeseen costs that might occur more than a decade in the future. The broker's view on long-term stock market prospects is positive and recommends additional equity investment.

25 Essay 0 / 1 point

Young decides to accept the retirement offer. Having very low liquidity needs, she wants to save part of the retirement payout for unforeseen costs that might occur more than a decade in the future. The broker's view on long term stock market prospects is positive and recommends additional equity investment.

Determine which of Young's accounts (education, retirement, reallocated money market, or unexpected needs) is *best* suited for implementing the broker's recommendation.

Account	Justification
Education	
Reallocated Money Market	
Retirement	

Unexpected Needs

(response not displayed)

Feedback

General feedback

Determine which of Young's accounts is *best* suited for implementing the broker's recommendation. (Choose one.)

Account	Justification
Education	
Reallocated Money Market	As a general rule, the portion of a taxable asset owner's assets that is eligible for lower tax rates and deferred capital gains tax treatment should first be allocated to the investor's taxable accounts. Equities should generally be held in taxable accounts, whereas taxable bonds and high turnover trading strategies should generally be located in tax-exempt and tax-deferred accounts. The reallocated money market account is a taxable account, whereas the retirement account is tax-deferred. The unexpected needs account requires liquidity (in case of unexpected needs), so it is better suited for shorter-term positions. Given the ages of Young's two daughters, now 17 and 20, the education account is most likely currently funding college expenses and will be for the next several years. Accordingly, it needs to be invested in highly liquid assets to cover these costs.
Retirement	
Unexpected Needs	

Vignette

Mark DuBord, a financial adviser, works with two university foundations, the Titan State Foundation (Titan) and the Fordhart University Foundation (Fordhart). He meets with each university foundation investment committee annually to review fund objectives and constraints.

Titan's portfolio has a market value of $10 million. After his annual meeting with its investment committee, DuBord notes the following points:

- Titan must spend 3% of its beginning-of-the-year asset value annually to meet legal obligations.
- The investment committee seeks exposure to private equity investments and requests DuBord's review of the Sun-Fin Private Equity Fund as a potential new investment.
- A recent declining trend in enrollment is expected to continue. This is a concern because it has led to a loss of operating revenue from tuition.
- Regulatory sanctions and penalties are likely to result in lower donations over the next five years.

DuBord supervises two junior analysts and instructs one to formulate new allocations for Titan. This analyst proposes the allocation presented in Exhibit 1.

Exhibit 1
Fund Information for Titan

Fund Name	Existing Allocation	Proposed Allocation	Fund Size in Billions (AUM)	Fund Minimum Investment
Global Equity Fund	70%	70%	$25	$500,000
Investment-Grade Bond Fund	27%	17%	$50	$250,000
Sun-Fin Private Equity Fund	0%	10%	$0.40	$1,000,000
Cash Equivalent Fund	3%	3%	$50	$100,000

26 Essay 0 / 1 point

Discuss *two* reasons why the proposed asset allocation is inappropriate for Titan.

(response not displayed)

Feedback

General feedback

The proposed asset allocation for Titan is not appropriate because:

1. Given the shift in enrollment trends and declining donations resulting from the sanctions, Titan will likely need greater liquidity in the future because of the increased probability of higher outflows to support university operations. The proposed asset allocation shifts Titan's allocation into risky assets (increases the relative equity holdings and decreases the relative bond holdings), which would introduce greater uncertainty as to their future value.
2. Titan is relatively small for the proposed addition of private equity. Access to such an asset class as private equity may be constrained for smaller asset owners, such as Titan, who may lack the related internal investment expertise. Additionally, the Sun-Fin Private Equity Fund minimum investment level is $1 million. This level of investment in private equity would be 10% of Titan's total portfolio value. Given Titan's declining financial position due to declining enrollments and its resulting potential need for liquidity, private equity at this minimum level of investment is not appropriate for Titan.

27 Essay 0 / 1 point

The Fordhart portfolio has a market value of $2 billion. After his annual meeting with its investment committee, DuBord notes the following points:

- Fordhart must spend 3% of its beginning-of-the-year asset value annually to meet legal obligations.

- The investment committee seeks exposure to private equity investments and requests that DuBord review the CFQ Private Equity Fund as a potential new investment.
- Enrollment is strong and growing, leading to increased operating revenues from tuition.
- A recent legal settlement eliminated an annual obligation of $50 million from the portfolio to support a biodigester used in the university's Center for Renewable Energy.

DuBord instructs his second junior analyst to formulate new allocations for Fordhart. This analyst proposes the allocation presented in Exhibit 2.

Exhibit 2
Fund Information for Fordhart

Fund Name	Existing Allocation	Proposed Allocation	Fund Size in Billions (AUM)	Fund Minimum Investment
Large-Cap Equity Fund	49%	29%	$50	$250,000
Investment-Grade Bond Fund	49%	59%	$80	$500,000
CFQ Private Equity Fund	0%	10%	$0.5	$5,000,000
Cash Equivalent Fund	2%	2%	$50	$250,000

Discuss *two* reasons why the proposed asset allocation is inappropriate for Fordhart.

(response not displayed)

Feedback

General feedback

The proposed asset allocation for Fordhart is inappropriate because:

1. Given the increasing enrollment trends and recent favorable legal settlement, Fordhart will likely require lower liquidity in the future. The proposed allocation shifts Fordhart's portfolio away from risky assets (decreases the relative equity holdings and increases the relative bond holdings).
2. The proposed 10% allocation to private equity creates an overly concentrated position in the underlying investment. A 10% allocation to the CFQ Private Equity Fund is $200 million (10% of Fordhart's $2 billion). The CFQ Private Equity Fund has assets under management (AUM) of $500 million. Hence, Fordhart would own 40% of the entire CFQ Private Equity Fund. This position exposes both Fordhart and the CFQ fund to an undesirable level of operational risk.

28 Multiple Choice 0 / 1 point

A taxable investor is considering the following portfolios invested in major economies with different sources of total return:

Expected Contribution to Total Return	Portfolio 1	Portfolio 2	Portfolio 3
Interest income	25%	25%	40%
Dividend income	30%	45%	30%
Long-term capital gains	45%	30%	30%

Which portfolio is *most likely* to be considered *least* tax efficient?

A. Portfolio 1

B. Portfolio 2

C. Portfolio 3

× (no answer)

Correct Answer: **C. Portfolio 3**

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29 Multiple Choice 0 / 1 point

Compared to its pretax return distribution, an asset's after-tax return distribution is *most likely* shifted lower:

A. and less dispersed.

B. with no change in its dispersion.

C. and more dispersed.

× (no answer)

Correct Answer: **A. and less dispersed.**

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30 Multiple Choice 0 / 1 point

An investor has decided to retire several years earlier than expected because he has just been offered an early-retirement package by his employer. The investor's financial advisor has suggested a review of his existing asset allocation. The reason for this review is *most likely* classified as a change in:

A. goals.

B. beliefs.

C. constraints.

× (no answer)

Correct Answer: **C. constraints.**

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31 Multiple Choice 0 / 1 point

Compared to large asset owners, smaller asset owners are *more likely* to:

A. have smaller allocations to private assets.

B. have greater ability to negotiate lower fees with external managers.

C. adjust their portfolio slower in response to short-term market movements.

× (no answer)

Correct Answer: **A. have smaller allocations to private assets.**

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32 Multiple Choice 0 / 1 point

The primary objective of tactical asset allocation is to:

A. establish long-term investment policy targets for asset class weights.

B. establish the most efficient asset class mixes in the presence of liabilities.

C. increase risk-adjusted return by taking advantage of short-term economic and financial market conditions.

× (no answer)

Correct Answer: **C. increase risk-adjusted return by taking advantage of short-term economic and financial market conditions.**

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33 Multiple Choice 0 / 1 point

To evaluate the success of tactical asset allocation decisions, the realized Sharpe ratio of the tactical asset allocation portfolio is commonly compared to the:

A. risk-free rate.

B. *t*-statistic of the strategic asset allocation portfolio.

C. Sharpe ratio of the strategic asset allocation portfolio.

× (no answer)

Correct Answer: **C. Sharpe ratio of the strategic asset allocation portfolio.**

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34 Multiple Choice 0 / 1 point

Which of the following behavioral biases is *most likely* to result in an investor overweighting their home country's securities?

A. Framing bias

B. Familiarity bias

C. Illusion of control bias

× (no answer)

Correct Answer: **B. Familiarity bias**

Retake