LEVEL III

Question: #1
Topic: Institutional PM
Minutes: 20

Reading References:

13 – "Managing Institutional Investor Portfolios," by R. Charles Tschampion, CFA, Laurence B. Siegel, Dean J. Takahashi, and John L. Maginn, CFA

LOS:
The candidate should be able to:

a. contrast a defined-benefit plan to a defined-contribution plan and discuss the advantages and disadvantages of each from the perspectives of the employee and the employer;
b. discuss investment objectives and constraints for defined-benefit plans;
c. evaluate pension fund risk tolerance when risk is considered from the perspective of the 1) plan surplus, 2) sponsor financial status and profitability, 3) sponsor and pension fund common risk exposures, 4) plan features, and 5) workforce characteristics;
d. prepare an investment policy statement for a defined-benefit plan;
e. evaluate the risk management considerations in investing pension plan assets;
f. prepare an investment policy statement for a participant directed defined-contribution plan;
g. discuss hybrid pension plans (e.g., cash balance plans) and employee stock ownership plans;
h. distinguish among various types of foundations, with respect to their description, purpose, and source of funds;
i. compare the investment objectives and constraints of foundations, endowments, insurance companies, and banks;
j. discuss the factors that determine investment policy for pension funds, foundation endowments, life and non-life insurance companies, and banks;
k. prepare an investment policy statement for a foundation, an endowment, an insurance company, and a bank;
l. contrast investment companies, commodity pools, and hedge funds to other types of institutional investors;
m. compare the asset/liability management needs of pension funds, foundations, endowments, insurance companies, and banks;
n. compare the investment objectives and constraints of institutional investors given relevant data, such as descriptions of their financial circumstances and attitudes toward risk.

Answer Question 1-A on This Page

1-A. **Calculate** the return requirement to fully fund *each* subscription option. **Determine** which subscription option is *most* appropriate for the endowment, given its objective and risk management practices. **Justify** your response.

Note: Use arithmetic returns, rather than geometric returns, for the return requirement calculations.

Basic

The investable base after payment of the one-time immediate initiation fee is:
Investable base $_{Basic}$ = USD 21,000,000 – USD 500,000 = USD 20,500,000

The return requirement is calculated using the sum of the annual subscription expense as a percentage of the investable base, the management fees, and total price inflation.
USD 800,000/USD 20,500,000 = .0390 = 3.9%
Return requirement $_{Basic}$ = 3.9%+ 0.5% + 2% +1% = 7.4%

Premium

The investable base after payment of the one-time immediate initiation fee is:
Investable base $_{Premium}$ = USD 21,000,000 – USD 1,000,000 = USD 20,000,000

The return requirement is calculated using the sum of the annual subscription expense as a percentage of the investable base, the management fees, and total price inflation.
USD 1,000,000/USD 20,000,000 = .0500 = 5.0%
Return requirement $_{Premium}$ = 5.0% + 0.5% + 2% +1% = 8.5%

The Basic option is most appropriate because its return requirement is below the endowment's return expectation. The expected portfolio surplus can then be used as a cushion to maintain purchasing power if investment performance deteriorates in the short term. The Premium option is not appropriate because its return requirement exactly equals the endowment's total return expectation. This would most likely impair the portfolio's ability to maintain purchasing power due to the volatility of the endowment's expected returns. Monte Carlo simulations show that the return requirement can be safely set equal to the return expectation *only* if expected returns have no volatility.

Answer Question 1-B on This Page

1-B. **Discuss**, other than the portfolio return requirement, *one* factor that: (see i. and ii. below)
Note: Restating case facts without additional support will not receive credit.

i. decreases the endowment's ability to take risk.

The factors (unrelated to the return requirement) that decrease the endowment's ability to take risk are as follows:

- The endowment's support to the university is essential in keeping the university competitive. Therefore, disruption in the subscription service due to poor returns would have serious consequences.
- The endowment is not expected to receive any donations in the foreseeable future. Lack of additional contributions limits the size of the investable base and reduces the portfolio's ability to absorb losses.

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ii. increases the endowment's ability to take risk.

The factors (unrelated to the return requirement) that increase the endowment's ability to take risk are as follows:

- The investment horizon is perpetual, allowing time to make up for poor short-term investment returns.
- The fund reinvests any surplus, resulting in an increased ability to maintain purchasing power.

Answer Question 1-C on This Page

Determine whether the foundation's ability to take risk is lower than, the same as, or higher than that of the Sopho College library endowment. (circle one)	**Justify** your response with *two* reasons.
lower than the same as higher than	The Prairie Foundation's ability to take risk is higher than that of the Sopho College endowment for the following reasons: • The Sopho College endowment does not expect any future donations, whereas the Prairie foundation recently received a substantial commitment relative to its market value. • The Prairie Foundation does not have a commitment to fund specific grants, whereas the Sopho College endowment's only purpose is to fully fund the library's annual online subscription expenses • Prairie's return requirement (4.3% spending rate + 0.2% management fees + 2.0% inflation = 6.5%) is lower than that of Sopho (7.4%).

Answer Question 1-D on This Page

Determine whether the foundation's target spending for the coming year will be lower, the same, or higher using the new spending rule instead of the old spending rate. (circle one)	**Justify** your response.
lower the same higher	The foundation's total target spending for the coming year will be higher using the new spending rule because higher portfolio values in the earlier years make the rolling three-year average higher than the lower recent portfolio value. While the 4.3% spending rate remains the same, the target spending will be higher using the new rule.

LEVEL III

Question: #2
Topic: Fixed Income
Minutes: 22

Reading References:

#22 – "Fixed-Income Portfolio Management—Part II," by H. Gifford Fong and Larry D. Guin, DBA, CFA

LOS:
The candidate should be able to:

a. evaluate the effect of leverage on portfolio duration and investment returns;

b. discuss the use of repurchase agreements (repos) to finance bond purchases and the factors that affect the repo rate;
c. critique the use of standard deviation, target semivariance, shortfall risk, and value at risk as measures of fixed-income portfolio risk;
d. demonstrate the advantages of using futures instead of cash market instruments to alter portfolio risk;
e. formulate and evaluate an immunization strategy based on interest rate futures;
f. explain the use of interest rate swaps and options to alter portfolio cash flows and exposure to interest rate risk;
g. compare default risk, credit spread risk, and downgrade risk and demonstrate the use of credit derivative instruments to address each risk in the context of a fixed-income portfolio;
h. explain the potential sources of excess return for an international bond portfolio;
i. evaluate 1) the change in value for a foreign bond when domestic interest rates change and 2) the bond's contribution to duration in a domestic portfolio, given the duration of the foreign bond and the country beta;
j. recommend and justify whether to hedge or not hedge currency risk in an international bond investment;
k. describe how breakeven spread analysis can be used to evaluate the risk in seeking yield advantages across international bond markets;
l. discuss the advantages and risks of investing in emerging market debt; discuss the criteria for selecting a fixed-income manager.

Answer Question 2-A on This Page

2-A. **Calculate** the percentage of MacDougal's domestic government portfolio that should be allocated to 10-year Tauravia government bonds to decrease the portfolio's duration to 6.00. **Show** your calculations.

The duration attributed to a foreign bond in the domestic portfolio is found by multiplying the bond's country beta (0.50) by the bond's duration in local terms (8.00). The duration of the Tauravia bonds held by investors in Scorponia = 0.50 x 8.00 = 4.00. Because the duration of the portfolio (w_p) is the weighted average of the durations of its fixed income investments, w_p = (weight of Scorponia × Scorponia duration) + (weight of Tauravia × Tauravia duration). With only two investments, the weight of Scorponia = 1 – weight of Tauravia = $(1 - w_T)$.

Given the target duration of 6.00, the weight of Tauravia bonds is:

$w_p = (1 - w_T) \times D_J + w_T \times D_T$
$6.00 = ((1 - w_T) \times 7.50) + (w_T \times 4.00)$
$6.00 = 7.50 - 7.50w_T + 4.00w_T$
$-1.50 = -3.50w_T$
$w_T = 42.86\%$

The weight of Tauravia bonds in the portfolio needed to achieve a portfolio duration of 6.00 is 42.86%.

Answer Question 2-B on This Page

2-B. **Calculate** the minimum change (in bps) in the yield for the Tauravia bond that would eliminate its *quarterly* yield advantage relative to the Scorponia bond. **Show** your calculations.

Note: Ignore the impact of currency movements.

The breakeven spread widening analysis is based on the higher of the two bonds' durations. Because Tauravia bonds' duration is higher than the Scorponia bonds' duration, the analysis is based on changes in the yield for Tauravia bonds. The yield spread between the Tauravia and Scorponia bonds is 320 basis points (7.50% – 4.30%), so the quarterly yield differential is 0.80% or 80 basis points (320/4). The change in price will need to eliminate that advantage. Let *W* denote the spread widening. Change in price = Duration × Change in yield: 80 bps = 8.0 × *W*. The spread widening (*W)* that would eliminate the quarterly differential between the bonds is 10 bps or 0.10%. If the yield in Tauravia bonds increases by 10 basis points, the quarterly yield advantage from Tauravia bonds will be eliminated for Scorponia investors.

Answer Question 2-C on This Page

2-C. **Determine** whether the Tauravia bonds would have a higher expected return over the coming year if the currency exposure is fully hedged or unhedged. **Justify** your response. **Show** your calculations.

Note: Assume MacDougal's spot exchange rate forecast is correct and there are no changes in the yield curves.

The Tauravia bonds have a higher expected return if unhedged. The unhedged return is approximately equal to the foreign bond return in local currency terms, r_l, plus the currency return, e, which is the expected percentage change in the spot exchange rate stated in terms of the home currency per unit of foreign currency. The unhedged return $\approx r_l + e$.
The expected change in the spot rate of the TRF is:

$$e = (S_{t+1} - S_t) / S_t$$
$$= (1.97 - 2.00) / 2.00$$
$$= -0.015 \text{ or } -1.5\%$$

The unhedged return ≈ 7.50% + (–1.50%) = 6.00%.

If MacDougal hedges the currency risk using a forward contract, the hedged return will be approximately equal to the local risk premium, plus the domestic interest rate. Alternatively, the hedged return is approximately equal to the local return plus the forward premium (the difference between the domestic and foreign risk-free interest rates). This is true because, by entering into the forward contract, MacDougal would be effectively paying the foreign interest rate and earning the domestic interest rate. Therefore, the fully hedged return is:
Hedged Return $\approx r_l + (i_d - i_f) = i_d + (r_l - i_f)$.
The fully hedged return ≈ 1.80% + (7.50% – 4.00%) = 1.80% + 3.50% = 5.30%.

Alternatively, the expected currency change of –1.50% is greater than the TRF forward premium of –2.20% (=1.80% – 4.00%) under IRP. Therefore, the expected currency loss is less if the bond is unhedged than if it is hedged, and the Tauravia bonds have a higher expected return if unhedged.

Alternative response:
The same conclusion can be reached by comparing the IRP forward rate with the future forecast spot exchange rate.
Future forecast exchange rate = 1.97 SCF/TRF
The IRP forward rate can be calculated as: 2.00 spot rate × (1.018 /1.04) = 1.9577 SCF/TRF
Since the IRP forward rate is lower than the future forecast spot exchange rate, the currency risk should be left unhedged.

Answer Question 2-D on This Page

Hedging strategy	**Select**, for *each* of the following, the *most* appropriate hedging strategy (buy long or sell short) that would address MacDougal's concern using a credit spread: (circle one)	**Determine** whether *each* strategy has a negative, zero, or positive payoff to Ethereal if the credit spread is 150 bps at expiration. (circle one)
i. forward contract.	[buy long] sell short	negative zero [positive]
ii. call option contract.	[buy long] sell short	negative zero [positive]

The following explanations are provided for informational purposes.

i. Forward contract
Given MacDougal's concerns about a credit spread increase, he should buy the credit spread forward contract (long). If the credit spread widens to 150 bps , the strategy would have a positive payoff.

Payoff from the credit spread forward = (Credit spread at forward contract maturity – Contracted credit spread) × Notional amount × Risk factor.
Payoff = (150 bps – 100 bps) × Notional amount × Risk factor, which is positive.

ii. Call option contract
Given MacDougal's concerns, he should buy a credit spread call option (long). If the credit spread widens to 150 bps, the strategy would have a positive payoff.

Payoff = Max[(Spread at the option maturity – credit strike spread) × Notional amount × Risk factor, 0]
= Max[(150 bps – 100 bps) × Notional Amount × Risk factor, 0], which is positive.

Answer Question 2-E on This Page

Determine whether MacDougal should buy or sell interest rate futures to achieve his duration objective. (circle one)	**Calculate** the number of contracts MacDougal should trade. **Show** your calculations.
buy sell	Because MacDougal has a target duration greater than the current duration, he should purchase futures contracts to achieve that objective. To lengthen the portfolio's duration to the objective of 10.00, the number of contracts that need to be purchased can be estimated by: $\text{Number of Contracts} = \frac{(D_T - D_I) \times P_I}{D_{CTD} \times P_{CTD}} \times \text{Conversion Factor of CTD bond}$ Where: D_T = the target duration of the portfolio D_I = the initial duration of the portfolio P_I = the initial market value of the portfolio D_{CTD} = the duration of the cheapest-to-deliver bond P_{CTD} = the price of the cheapest-to-deliver bond $\text{Number of Contracts} = \frac{(10.00 - 8.00) \times 200{,}000{,}000}{7.6 \times 103{,}500} \times 0.85 = 432.24 \text{ contracts}$ MacDougal should buy 432 contracts to achieve his objective.

LEVEL III

Question: #3
Topic: Equity
Minutes: 19

Reading References:
#23 – "Equity Portfolio Management," by Gary L. Gastineau, Andrew R. Olma, CFA, and Robert G. Zielinski, CFA

LOS:
The candidate should be able to:

a. discuss the role of equities in the overall portfolio;

b. discuss the rationales for passive, active, and semiactive (enhanced index) equity investment approaches and distinguish among those approaches with respect to expected active return and tracking risk;
c. recommend an equity investment approach when given an investor's investment policy statement and beliefs concerning market efficiency;
d. distinguish among the predominant weighting schemes used in the construction of major equity market indices and evaluate the biases of each;
e. compare alternative methods for establishing passive exposure to an equity market, including indexed separate or pooled accounts, index mutual funds, exchange-traded funds, equity index futures, and equity total return swaps;
f. compare full replication, stratified sampling, and optimization as approaches to constructing an indexed portfolio and recommend an approach when given a description of the investment vehicle and the index to be tracked;
g. explain and justify the use of equity investment–style classifications and discuss the difficulties in applying style definitions consistently;
h. explain the rationales and primary concerns of value investors and growth investors and discuss the key risks of each investment style;
i. compare techniques for identifying investment styles and characterize the style of an investor when given a description of the investor's security selection method, details on the investor's security holdings, or the results of a returns-based style analysis;
j. compare the methodologies used to construct equity style indices;
k. interpret the results of an equity style box analysis and discuss the consequences of style drift;
l. distinguish between positive and negative screens involving socially responsible investing criteria and discuss their potential effects on a portfolio's style characteristics;
m. compare long–short and long-only investment strategies, including their risks and potential alphas, and explain why greater pricing inefficiency may exist on the short side of the market;
n. explain how a market-neutral portfolio can be "equitized" to gain equity market exposure and compare equitized market-neutral and short-extension portfolios;
o. compare the sell disciplines of active investors;
p. contrast derivatives-based and stock-based enhanced indexing strategies and justify enhanced indexing on the basis of risk control and the information ratio;
q. recommend and justify, in a risk-return framework, the optimal portfolio allocations to a group of investment managers;
r. explain the core-satellite approach to portfolio construction and discuss the advantages and disadvantages of adding a completeness fund to control overall risk exposures;

s. distinguish among the components of total active return ("true" active return and "misfit" active return) and their associated risk measures and explain their relevance for evaluating a portfolio of managers;
t. explain alpha and beta separation as an approach to active management and demonstrate the use of portable alpha;
u. describe the process of identifying, selecting, and contracting with equity managers;
v. contrast the top-down and bottom-up approaches to equity research.

Answer Question 3-A on This Page

3-A. **Calculate** the information ratio for the total equity allocation, assuming Nielsen's proposal is adopted. **Show** your calculations.

The information ratio is calculated as portfolio active return divided by portfolio active risk. Expected active return for the total equity allocation is calculated as:

$$\text{Portfolio active return} = \sum_{i=1}^{n} h_{Ai} r_{Ai}$$

where, h_{Ai} = the weight assigned to the *i*th manager
r_{Ai} = the active return of the *i*th manager

If Nielsen's proposal is adopted, the 55% weight allocated to US large-cap growth would be replaced by a pure indexing strategy with an alpha of zero. Therefore, the portfolio's active return would be:

= (0.55*0) + (0.20*2.3) + (0.25*3.5)
= 1.335%

Given the assumption that expected active returns are uncorrelated, the expected total portfolio active risk for the total equity allocation is calculated as:

$$\text{Portfolio active risk} = \sqrt{\sum_{i=1}^{n} h_{Ai}^2 \sigma_{Ai}^2}$$

where, h_{Ai} = the weight assigned to the *i*th manager
σ_{Ai} = the active risk of the *i*th manager

Because the pure indexing strategy has a tracking risk of zero, the portfolio's active risk would be:

$= \sqrt{(0.55)^2(0)^2 + (0.20)^2(4)^2 + (0.25)^2(8)^2}$
= 2.154% or 215.4 bps

Therefore, the information ratio is:
= 1.335% / 2.154%
= 0.62

Answer Question 3-B on This Page

Style	**Support**, with *both* a returns-based reason and a holdings-based reason for *each* of the following, Nielsen's belief regarding the mandate's style.	
	Returns-based reason	Holdings-based reason
i. large-cap style.	The style weight of the fund for large-cap growth decreased (from 85% to 58%), while the style weight for small-cap growth increased from (5% to 32%). Thus, the fund no longer is consistent with large-cap style.	The fund has an underweight to the top quartile versus the benchmark (33% fund weight versus 45% benchmark weight) and an overweight position to the bottom three quartiles of issuers by market cap.
ii. growth style.	The fund exhibits high style weights to both large-cap growth (58%) and small-cap growth (32%), with only a very low style weight to large- and small-cap value (10% total).	The fund shows higher P/E and P/B ratios and a lower dividend yield than the benchmark, all of which are consistent with a growth bias.

Answer Question 3-C on This Page

Select the manager from Exhibit 4 that is *most* appropriate as a component of Nielsen's overall strategy. (circle one)		
Carina	Ara	Octans

Explain how a strategy following Nielsen's guidelines would:	
i. maintain the beta exposure of the emerging market equity allocation.	Nielsen would maintain the beta exposure to the emerging market equity allocation by purchasing index futures.
ii. provide no additional beta exposure.	Octans would avoid additional beta exposure as the market-neutral portfolio bears no systematic risk and should offer only the risk-free rate plus any alpha generated. To avoid additional Beta exposure with Carina and Ara, Nielsen would need to short small-cap equity futures, which is not allowed by the guidelines.

LEVEL III

Question: #4
Topic: Asset Allocation
Minutes: 13

Reading References:

#17 – "Asset Allocation," by William F. Sharpe, Peng Chen, PhD, CFA, Jerald E. Pinto, PhD, CFA, and Dennis W. McLeavey, CFA

LOS:
The candidate should be able to:

a. explain the function of strategic asset allocation in portfolio management and discuss its role in relation to specifying and controlling the investor's exposures to systematic risk;

b. compare strategic and tactical asset allocation;
c. discuss the importance of asset allocation for portfolio performance;
d. contrast the asset-only and asset/liability management (ALM) approaches to asset allocation and discuss the investor circumstances in which they are commonly used;
e. explain the advantage of dynamic over static asset allocation and discuss the trade-offs of complexity and cost;
f. explain how loss aversion, mental accounting, and fear of regret may influence asset allocation policy;
g. evaluate return and risk objectives in relation to strategic asset allocation;
h. evaluate whether an asset class or set of asset classes has been appropriately specified;
i. select and justify an appropriate set of asset classes for an investor;
j. evaluate the theoretical and practical effects of including additional asset classes in an asset allocation;
k. demonstrate the application of mean–variance analysis to decide whether to include an additional asset class in an existing portfolio;
l. describe risk, cost, and opportunities associated with nondomestic equities and bonds;
m. explain the importance of conditional return correlations in evaluating the diversification benefits of nondomestic investments;
n. explain expected effects on share prices, expected returns, and return volatility as a segmented market becomes integrated with global markets;
o. explain the major steps involved in establishing an appropriate asset allocation;
p. discuss the strengths and limitations of the following approaches to asset allocation: mean–variance, resampled efficient frontier, Black–Litterman, Monte Carlo simulation, ALM, and experience based;
q. discuss the structure of the minimum-variance frontier with a constraint against short sales;
r. formulate and justify a strategic asset allocation, given an investment policy statement and capital market expectations;
s. compare the considerations that affect asset allocation for individual investors versus institutional investors and critique a proposed asset allocation in light of those considerations;
t. formulate and justify tactical asset allocation (TAA) adjustments to strategic asset class weights, given a TAA strategy and expectational data.

Answer Question 4-A on This Page

4-A. **Recommend** which *two* corner portfolios Darzi should use for the optimal asset allocation to achieve the endowment's return requirement. **Determine** the weights for *each* of these two corner portfolios. **Show** your calculations.

The two corner portfolios Darzi should use for the optimal asset allocation to achieve Wellcare Endowment's return requirement are Portfolio #3 and Portfolio #4. The stated return requirement for the Wellcare Endowment is 8.0%. Hence, the most appropriate allocation is a combination of Corner Portfolios #3 and #4, which have expected returns just above and below the return requirement.

The weights of the corner portfolios for the optimal strategic asset allocation are 36.8% of Portfolio #3 and 63.2% of Portfolio #4. Weights of Corner Portfolios #3 and #4 are calculated as follows:

Return Requirement = (w) × Return Portfolio #3 + (1 – w) x Return Portfolio #4
8.0% = (w) × 8.60% + (1 – w) x 7.65%
8.0 = 8.60w + 7.65 – 7.65w
0.35 = 0.95w
w = 0.368
= 36.8% of Corner Portfolio #3
1-w = (1 – 0.368)
= 0.632
= 63.2% of Corner Portfolio #4

Answer Question 4-B on This Page

4-B. **Calculate** the optimal level of leverage to achieve the endowment's return objective. **Show** your calculations.

With the ability to use leverage, the Wellcare Endowment can combine the corner portfolio closest to the tangency portfolio with borrowing at the risk-free rate to select a portfolio on the capital allocation line. The corner portfolio closest to the tangency portfolio is the one with the highest Sharpe-ratio. This is Corner Portfolio 4, which has an expected return of 7.65%. Borrowing is done at a rate of 0.5%. The stated return requirement is 8.0%.

The optimal level of leverage required to achieve the required return is determined as follows:

$$8.0\% = (w) \times 7.65\% + (1-w) \times 0.5\%$$
$$8.0 = 7.65w + 0.5 - 0.5w$$
$$7.5 = 7.15w$$

$$w = 1.049$$

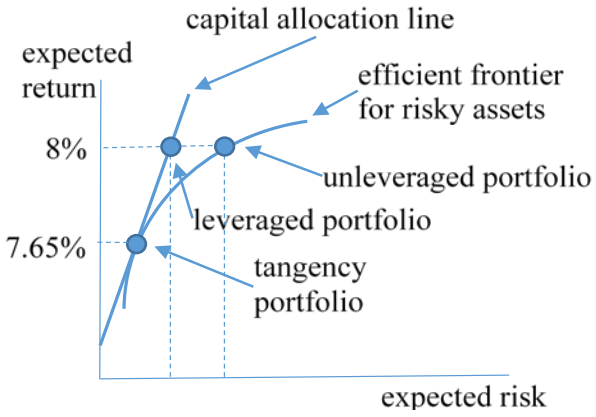
Hence, the optimal level of leverage is 4.9% or 1.049 times

Answer Question 4-C on This Page

4-C. **Determine** whether the unleveraged or leveraged strategic asset allocation offers lower expected volatility to achieve the endowment's return objective. **Justify** your response.

Note: No calculations are required.

The leveraged strategic asset allocation offers lower expected volatility than the unleveraged allocation to achieve the required return. If no leverage is used, to achieve the required return you would use a combination of Corner Portfolios #3 and #4. The Sharpe ratio of that combination is between the individual Sharpe ratios of the Corner Portfolios. If leverage is used, Corner Portfolio #4 can be combined with borrowing to achieve rate required return. The resulting Sharpe ratio would be that of Corner Portfolio #4, which is higher than combined portfolios. This means the volatility is lower for the leveraged portfolio. This can be illustrated as follows:



LEVEL III

Question: #5
Topic: Trading, Monitoring, Rebalancing
Minutes: 13

Reading References:

29 – **"**Execution of Portfolio Decisions," by Ananth Madhavan, Jack L. Treynor, and Wayne H. Wagner
30 – "Monitoring and Rebalancing," by Robert D. Arnott, Terence E. Burns, CFA, Lisa Plaxco, CFA, and Philip Moore

Reading # 29 LOS:
The candidate should be able to:

a. compare market orders with limit orders, including the price and execution uncertainty of each;

b. calculate and interpret the effective spread of a market order and contrast it to the quoted bid–ask spread as a measure of trading cost;
c. compare alternative market structures and their relative advantages;
d. compare the roles of brokers and dealers;
e. explain the criteria of market quality and evaluate the quality of a market when given a description of its characteristics;
f. explain the components of execution costs, including explicit and implicit costs, and evaluate a trade in terms of these costs;
g. calculate and discuss implementation shortfall as a measure of transaction costs;
h. contrast volume weighted average price (VWAP) and implementation shortfall as measures of transaction costs;
i. explain the use of econometric methods in pretrade analysis to estimate implicit transaction costs;
j. discuss the major types of traders, based on their motivation to trade, time versus price preferences, and preferred order types;
k. describe the suitable uses of major trading tactics, evaluate their relative costs, advantages, and weaknesses, and recommend a trading tactic when given a description of the investor's motivation to trade, the size of the trade, and key market characteristics;
l. explain the motivation for algorithmic trading and discuss the basic classes of algorithmic trading strategies;
m. discuss the factors that typically determine the selection of a specific algorithmic trading strategy, including order size, average daily trading volume, bid–ask spread, and the urgency of the order;
n. explain the meaning and criteria of best execution;
o. evaluate a firm's investment and trading procedures, including processes, disclosures, and record keeping, with respect to best execution;
p. discuss the role of ethics in trading.

Reading # 30 LOS:
The candidate should be able to:

q. discuss a fiduciary's responsibilities in monitoring an investment portfolio;
r. discuss the monitoring of investor circumstances, market/economic conditions, and portfolio holdings and explain the effects that changes in each of these areas can have on the investor's portfolio;

s. recommend and justify revisions to an investor's investment policy statement and strategic asset allocation, given a change in investor circumstances;
t. discuss the benefits and costs of rebalancing a portfolio to the investor's strategic asset allocation;
u. contrast calendar rebalancing to percentage-of-portfolio rebalancing;
v. discuss the key determinants of the optimal corridor width of an asset class in a percentage-of-portfolio rebalancing program;
w. compare the benefits of rebalancing an asset class to its target portfolio weight versus rebalancing the asset class to stay within its allowed range;
x. explain the performance consequences in up, down, and flat markets of 1) rebalancing to a constant mix of equities and bills, 2) buying and holding equities, and 3) constant proportion portfolio insurance (CPPI);
y. distinguish among linear, concave, and convex rebalancing strategies;
z. judge the appropriateness of constant mix, buy-and-hold, and CPPI rebalancing strategies when given an investor's risk tolerance and asset return expectations.

Answer Question 5-A on This Page

5-A. **Explain** *two* disadvantages of Cole's proposed technique for the BLUE trade execution.

Advertise-to-draw-liquidity is an explicit liquidity-enhancing technique used with initial public offerings, secondary offerings, and sunshine trades, which publicly displays the trading interest in advance of the actual order. If publicity attracts enough traders taking the opposite side, the trade might execute with little or no market impact.

The disadvantages of the advertise-to-draw liquidity technique for the BLUE execution are as follows:

1. Cole is an information-motivated trader, and wants to establish a large position (relative to average daily volume) quickly because his proprietary research led him to believe that the share price of BLUE will increase substantially. Advertising could draw out the other side of the trade, but doesn't guarantee immediate execution.

2. The advertise-to-draw-liquidity technique can also bear the risk of others trading in front of the order. It could cause information leakage to front runners, increasing the share price ahead of Cole's execution.

Answer Question 5-B on This Page

5-B. **Calculate** the share-volume-weighted effective spread for the LIVS transaction. **Show** your calculations.

The effective spread is two times the deviation of the actual execution price from the midpoint of the market quote at the time an order is entered. Because the LIVS order executed at two different prices, the share-volume weighted spread is used in computing the deviation from the midpoint.

For the first trade, the midpoint of the market at the time the order is entered is:
(EUR 21.07 + EUR 21.13)/2 = EUR 21.10
so the effective spread = 2 × (EUR 21.13 – EUR 21.10) = EUR 0.06

For the second trade, the midpoint of the market at the time the order is entered is:
(EUR 21.05 + EUR 21.11)/2 = EUR 21.08
so the effective spread = 2 × (EUR 21.09 – EUR 21.08) = EUR 0.02

The share-volume-weighted effective spread is:
((EUR 0.06 × 2,000) + (EUR 0.02 × 1,000))/(2,000 + 1,000) = EUR 0.047

Answer Question 5-C on This Page

Determine, given Cole's objective, the *most* appropriate rebalancing strategy for Milton. (circle one)	**Explain** why the two strategies *not* selected are *less* appropriate.
buy-and-hold	
constant-mix	The constant-mix strategy outperforms buy-and-hold in a flat but oscillating market, but is consistent with a constant risk tolerance (constant proportion of assets in risky securities). This is inconsistent with Cole's willingness to invest a greater proportion of his wealth in risky assets as his portfolio value increases.
CPPI	In a flat but oscillating market, the buy-and-hold strategy will outperform CPPI. The CPPI strategy is consistent with increasing risk tolerance (at a faster rate than buy-and-hold) as wealth increases.

LEVEL III

Question: #6
Topic: Individual PM
Minutes: 22

Reading References:

8 – **"**Managing Individual Investor Portfolios," by James W. Bronson, CFA, Matthew H. Scanlan, CFA, and Jan R. Squires, DBA, CFA
12 – "Lifetime Financial Advice: Human Capital, Asset Allocation, and Insurance," by Roger G. Ibbotson, PhD, Moshe A. Milevsky, PhD, Peng Chen, PhD, CFA, and Kevin X. Zhu, PhD

Reading # 8 LOS:
The candidate should be able to:

- **a. discuss how source of wealth, measure of wealth, and stage of life affect an individual investors' risk tolerance;**
- b. explain the role of situational and psychological profiling in understanding an individual investor's attitude toward risk;
- c. explain the influence of investor psychology on risk tolerance and investment choices;
- d. explain potential benefits, for both clients and investment advisers, of having a formal investment policy statement;
- e. explain the process involved in creating an investment policy statement;
- f. distinguish between required return and desired return and explain how these affect the individual investor's investment policy;
- **g. explain how to set risk and return objectives for individual investor portfolios and discuss the impact that ability and willingness to take risk have on risk tolerance;**
- h. discuss the major constraint categories included in an individual investor's investment policy statement;
- i. prepare and justify an investment policy statement for an individual investor;
- j. determine the strategic asset allocation that is most appropriate for an individual investor's specific investment objectives and constraints;
- **k. compare Monte Carlo and traditional deterministic approaches to retirement planning and explain the advantages of a Monte Carlo approach.**

Reading # 12 LOS:
The candidate should be able to:

- a. explain the concept and discuss the characteristics of "human capital" as a component of an investor's total wealth;
- b. discuss the earnings risk, mortality risk, and longevity risk associated with human capital and explain how these risks can be reduced by appropriate portfolio diversification, life insurance, and annuity products;
- c. explain how asset allocation policy is influenced by the risk characteristics of human capital and the relative relationships of human capital, financial capital, and total wealth;
- d. discuss how asset allocation and the appropriate level of life insurance are influenced by the joint consideration of human capital, financial capital, bequest preferences, risk tolerance, and financial wealth;
- **e. discuss the financial market risk, longevity risk, and savings risk faced by investors in retirement and explain how these risks can be reduced by appropriate portfolio diversification, insurance products, and savings discipline;**
- f. discuss the relative advantages of fixed and variable annuities as hedges against longevity risk;
- g. recommend basic strategies for asset allocation and risk reduction when given an investor profile of key inputs, including human capital, financial capital, stage of life cycle, bequest preferences, risk tolerance, and financial wealth.

Answer Question 6-A on This Page

6-A. **Identify** *one* factor that:

i. decreases the Mattisons' ability to take risk.

- The Mattisons plan to make a large cash outlay, relative to their current savings, in five years to purchase a second home.
- The Mattisons have a small asset base relative to their spending needs. They are making up for that by saving a significant portion of the income in order to prepare for retirement.

ii. increases the Mattisons' ability to take risk.

- They are net savers (annual savings of EUR 100,000): their after-tax salaries more than cover their living expenses and generate savings without the need to use investment income.
- They have a long time horizon because they are relatively young and plan to work for another 15 years. They could delay retirement or return to work if needed, and still have a large amount of human capital.
- The liquidity requirement for the second home is a "want", not a "need." They could stay in their current home if necessary.
- Paul Mattison will be entitled to an inflation-adjusted pension upon retirement. Although it might not cover all of their expenses, it serves as a cushion against a decline in portfolio value.
- They currently have no debt, which increases their financial flexibility.

Answer Question 6-B on This Page

6-B. **Identify** *one* factor that:

i. decreases the Mattisons' ability to take risk compared to five years ago.

- They are five years older which means their life expectancy is shorter than it was five years ago. As a result, the couple has less time to convert human capital into financial capital and to recover from any shortfall in the market.
- With the mortgage payments on the new house, they are now able to save only EUR 72,000 per year rather than EUR 100,000.
- The Mattisons have increased their indebtedness with the new mortgage, which decreases their financial flexibility.

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ii. increases the Mattisons' ability to take risk compared to five years ago.

- The Mattisons have a much larger asset base, relative to their spending level compared to five years ago.
- The Mattisons no longer have a large cash outlay on the horizon for their house purchase.

Answer Question 6-C on This Page

6-C. **Calculate** the minimum annual after-tax return required for the Mattisons to be able to retire in 10 years, assuming Greer's assumptions are correct.

Note: Assume all cash flows occur at month-end.

Step 1:
The current value of the Mattisons' first home is EUR 290,000 and it is expected to appreciate 3% per year for the next 10 years. Therefore, the future value of their first home is:

Present value (PV)	:	(EUR 290,000)
Expected rate of return (i)	:	3%
Number of years (n)	:	10 years
Solve for	:	
Future value (FV)	:	EUR 389,736

OR

$FV = 290{,}000 \times (1.03)^{10} = EUR\ 389{,}736$

The future value of the first home is deducted from the ending portfolio value indicated by Greer:
EUR 3,000,000 – EUR 389,736 = EUR 2,610,264

The Mattisons' investment portfolio will need to grow from a starting value of EUR 700,000 to an adjusted ending value of EUR 2,610,264 in 10 years.

Step 2:
The Mattisons would need to earn an annual after-tax investment return of 7.81% (or 8.09%) in order to be able to retire in ten years.

Present value (PV)	:	(EUR 700,000)
Savings (PMT)	:	(EUR 72,000) ÷ 12 = (EUR 6,000) per month
Future value (FV)	:	EUR 2,610,264
Number of periods (n)	:	10 years x 12 months = 120 months
Solve for	:	
Expected rate of return (i)	:	0.6506% (monthly)

Annualized after-tax return: 0.65% x 12 = 7.80% or 0.6506% x 12 = 7.81% or $1.0065^{12} - 1$ = 8.09%

Answer Question 6-D on This Page

6-D. **Discuss**, based *only* on the information provided, *one* benefit and *one* shortcoming of Greer's consideration of a Monte Carlo simulation approach.

Greer's recommended Monte Carlo simulation approach has the following benefits:

- It provides a distribution of probable outcomes rather than a point estimate. This allows the Mattisons to determine the likelihood (or probability) of reaching their retirement goals.
- It captures the multi-period effects of tax changes. Greer believes a capital gains tax will be enacted sometime in the next few years.

The shortcoming of the advisor's recommendation is that it does not take into consideration Greer's belief that the market environment in the Mattisons' retirement years is likely to be fundamentally different than during their working years. Because her recommended Monte Carlo simulation approach relies on the past 30 years of market data, it does not incorporate her expectations for the future financial market environment.

Answer Question 6-E on This Page

Determine the *most likely* effect (decrease, no change, increase) on the Mattisons' longevity risk of accepting the DC conversion offer. (circle one)	**Justify** your response.
decrease no change increase	Longevity risk, which is the risk that the Mattisons outlive their assets, increases when the regularly scheduled payments for life are converted into a lump sum, which would be subject to market risk. The EUR 40,000 annual pension payment, indexed to inflation, provides the Mattisons at least some guaranteed income each year for the remainder of their lives. However, if Paul accepts the conversion from defined benefit plan to defined contribution plan, the responsibility for holding sufficient assets for the Mattisons' lifetime shifts from his employer to Marta and himself. While the 10% bonus does add to the Mattisons' assets, it does not alter the fact that the risk of outliving those assets has shifted completely to the Mattisons.

LEVEL III

Question: #7
Topic: Individual PM
Minutes: 17

Reading References:
11 – **"**Concentrated Single Asset Positions," by Thomas J. Boczar, Esq., LL.M., CFA, and Nischal R. Pai, CFA
6 – "The Behavioral Biases of Individuals," by Michael M. Pompian, CFA

Reading #11 LOS:
The candidate should be able to:

a. explain investment risks associated with a concentrated position in a single asset and discuss the appropriateness of reducing such risks;

b. describe typical objectives in managing concentrated positions;
c. discuss tax consequences and illiquidity as considerations affecting the management of concentrated positions in publicly traded common shares, privately held businesses, and real estate;
d. discuss capital market and institutional constraints on an investor's ability to reduce a concentrated position;
e. discuss psychological considerations that may make an investor reluctant to reduce his or her exposure to a concentrated position;
f. describe advisers' use of goal-based planning in managing concentrated positions;
g. explain uses of asset location and wealth transfers in managing concentrated positions;
h. describe strategies for managing concentrated positions in publicly traded common shares;
i. discuss tax considerations in the choice of hedging strategy;
j. describe strategies for managing concentrated positions in privately held businesses;
k. describe strategies for managing concentrated positions in real estate;
l. evaluate and recommend techniques for tax efficiently managing the risks of concentrated positions in publicly traded common stock, privately held businesses, and real estate.

Reading #6 LOS:
The candidate should be able to:
a. distinguish between cognitive errors and emotional biases;
b. discuss commonly recognized behavioral biases and their implications for financial decision making;
c. identify and evaluate an individual's behavioral biases;
d. evaluate how behavioral biases affect investment policy and asset allocation decisions and recommend approaches to mitigate their effects.

Answer Question 7-A on This Page

7-A. **Identify** the cognitive behavioral bias *most likely* exhibited by Gonzalez. **Justify** your response.

Gonzalez exhibits the cognitive bias of confirmation. Confirmation is looking for information that validates (or confirms) one's opinions or beliefs, and ignoring what contradicts them. Gonzalez searches for expert opinions that would support (or confirm) her opinion of the company's valuation. She ignores consistent evidence from the acquisitions in her company's industry.

Answer Question 7-B on This Page

Select the monetization strategy that will *most likely* achieve *all* of Gonzalez's objectives. (circle one)	**Identify**, for *each* strategy *not* selected, *one* objective it fails to achieve.
1. Partial sale to a private equity firm through a leveraged recapitalization	
2. Partial sale through an initial public offering	<u>Avoid scrutiny from the broad investment community</u> A partial sale through an IPO would not allow Gonzalez to avoid scrutiny from the broad investment community because her management decisions would be subject to attention from shareholders and analysts.
3. Full sale to the senior management team in a management buyout	<u>Keep her current management responsibilities OR retain some upside exposure to the value of the business</u> A full sale to the senior management team would likely not allow Gonzalez to keep her current management responsibilities. These would be relinquished to the group of capable senior managers that are purchasing the company. She would also *not* be able to retain any upside exposure to the value of the business because she would have sold the entire company to the senior management team.
4. Borrow through a personal line of credit secured by company shares	<u>Surrender majority ownership of the company</u> A personal line of credit secured by company shares would not allow Gonzalez to surrender majority ownership of the company because she would continue to be the sole owner of the business.

Answer Question 7-C on This Page

7-C. **Calculate** the initial net proceeds (in USD) of *each* of the following methods:

i. mortgage financing

If Gonzalez opts for a mortgage financing, which does *not* trigger a taxable event, the initial net proceeds are:

Asset value (A)	:	USD 15,000,000
Loan to value ratio (LTV)	:	75%
Net proceeds (A x LTV)	:	USD 11,250,000

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ii. sale and leaseback

If Gonzalez opts for a sale and leaseback, a taxable event occurs.

The asset value is USD 15,000,000 with a cost basis of 15% of that value, or USD 2,250,000. The difference between the market value and cost basis, USD 12,750,000, is taxed at a 30% rate, resulting in taxes of USD 3,825,000. The net after-tax proceeds is then USD 11,175,000 (USD 15,000,000 – USD 3,825,000)

LEVEL III

Question: #8
Topic: Risk Management
Minutes: 20

Reading References:

26 – **"**Risk Management Applications of Forward and Futures Strategies," by Don M. Chance, PhD, CFA
27 – "Risk Management Applications of Option Strategies," by Don M. Chance, PhD, CFA

Reading # 26 LOS:
The candidate should be able to:

a. demonstrate the use of equity futures contracts to achieve a target beta for a stock portfolio and calculate and interpret the number of futures contracts required;

b. construct a synthetic stock index fund using cash and stock index futures (equitizing cash);
c. explain the use of stock index futures to convert a long stock position into synthetic cash;
d. demonstrate the use of equity and bond futures to adjust the allocation of a portfolio between equity and debt;
e. demonstrate the use of futures to adjust the allocation of a portfolio across equity sectors and to gain exposure to an asset class in advance of actually committing funds to the asset class;
f. explain exchange rate risk and demonstrate the use of forward contracts to reduce the risk associated with a future receipt or payment in a foreign currency;
g. explain the limitations to hedging the exchange rate risk of a foreign market portfolio and discuss feasible strategies for managing such risk.

Reading # 27 LOS:
The candidate should be able to:
a. compare the use of covered calls and protective puts to manage risk exposure to individual securities;
b. calculate and interpret the value at expiration, profit, maximum profit, maximum loss, breakeven underlying price at expiration, and general shape of the graph for the following option strategies: bull spread, bear spread, butterfly spread, collar, straddle, box spread;
c. calculate the effective annual rate for a given interest rate outcome when a borrower (lender) manages the risk of an anticipated loan using an interest rate call (put) option;
d. calculate the payoffs for a series of interest rate outcomes when a floating rate loan is combined with 1) an interest rate cap, 2) an interest rate floor, or 3) an interest rate collar;
e. explain why and how a dealer delta hedges an option position, why delta changes, and how the dealer adjusts to maintain the delta hedge;
f. interpret the gamma of a delta-hedged portfolio and explain how gamma changes as in-the-money and out-of-the-money options move toward expiration.

Answer Question 8-Ai on This Page

8-A. **Determine**, to achieve Thurman's desired asset allocation and bond portfolio modified duration, the number of:

i. equity index futures contracts she should sell. **Show** your calculations.

Thurman needs to shift 25% of the USD 150 million portfolio, or USD 37.5 million, from equity to bonds. Therefore, she effectively needs to sell USD 37.5 million of equity by converting it to cash using equity index futures and buy USD 37.5 million of bonds using bond futures.

To reduce the equity allocation, Thurman needs to execute:
$N_{sf} = \{(\beta_T - \beta_S)/\beta_f\} \times S/f_s$

Where,
N_{sf} = number of equity index futures contracts
β_T = target beta (0 for cash)
β_S = beta of existing portfolio (1.08)
β_f = futures beta (0.95)
S = market value of portfolio to be reallocated (37,500,000)
f_s = equity index futures price (125,000)

$N_{sf} = \{(0.0 - 1.08)/0.95\} \times (37{,}500{,}000 / 125{,}000) = -341.053$

Therefore, Thurman should sell 341 equity index futures contracts.

Answer Question 8-Aii on This Page

8-A. **Determine**, to achieve Thurman's desired asset allocation and bond portfolio modified duration, the number of:

ii. bond futures contracts she should buy. **Show** your calculations.

To increase the bond allocation, Thurman first needs to execute:
$N_{bf} = \{(MDUR_T - MDUR_B)/MDUR_f\} \times B/f_b$

Where,
N_{bf} = number of bond futures contracts
$MDUR_T$ = target modified duration (6.05 for current portfolio)
$MDUR_B$ = modified duration of existing portfolio (0 for synthetic cash generated)
$MDUR_f$ = modified duration of futures contract (7.50)
B = market value of portfolio to be reallocated (37,500,000)
f_b = bond futures price (105,000)

$N_{bf} = \{(6.05 - 0.00)/7.50\} \times (37{,}500{,}000 / 105{,}000) = 288.095$

Second, to decrease the modified duration of the new bond portion (USD 150 million x 50% = USD 75 million) to 5.5, Thurman needs to execute:
$N_{bf} = \{(5.50 - 6.05)/7.50\} \times (75{,}000{,}000 / 105{,}000) = -52.381$

Therefore, the number of bond futures contracts to buy is $288.095 - 52.381 = 235.714 \approx 236$.

Answer Question 8-B on This Page

8-B. **Determine**, one week before expiration, which option's delta hedge is the *most* difficult to maintain. **Justify** your response.

The option with the highest gamma will be the one for which the delta hedge is most difficult to maintain. Gamma measures the change in delta for a given change in the underlying. Gamma is highest for an option that is closest at-the-money and near expiration. C(135) has the highest gamma because it is the one closest to at-the-money. All three options have the same expiration.

Answer Question 8-C on This Page

8-C. **Calculate** the effective annual rate (in bps) on the loan. **Show** your calculations.

The premium compounded for 109 days at the original LIBOR of 2.2% + 300 bps is:

USD 86,000{1+(0.022+0.03)(109/360)} = USD 87,354.02

The effective loan proceeds are

USD 80,000,000 – USD 87,354.02 = USD 79,912,645.98

The loan interest is:

USD 80,000,000(0.035+0.03)(180/360) = USD 2,600,000

The call payoff at expiration is:

USD 80,000,000 × max (0, LIBOR – 0.02)(180/360)

For LIBOR of 3.5%, the payoff is:

USD 80,000,000 × max (0, 0.035–0.02)(180/360) = USD 600,000

The loan interest minus the call payoff which is given above is the effective interest rate. Therefore, the effective rate on the loan is:

Effective rate = ((Loan principal + Loan interest – Payoff from Call) / (Effective net loan proceeds))$^{365/180}$ –1

= {(USD 80,000,000 + USD 2,600,000 – USD 600,000)/(USD 79,912,645.98)}$^{365/180}$ – 1 = 0.0537, or 5.37%.

OR

{(USD 80,000,000 + USD 2,600,000 – USD 600,000)/(USD 79,912,645.98)}$^{360/180}$ – 1 = 0.0529, or 5.29%.

LEVEL III

Question: #9
Topic: Economics
Minutes: 18

Reading References:

15 – **"**Capital Market Expectations," by John P. Calverley, Alan M. Meder, CPA, CFA, Brian D. Singer, CFA, and Renato Staub, PhD

LOS:
The candidate should be able to:

a. discuss the role of, and a framework for, capital market expectations in the portfolio management process;

b. discuss challenges in developing capital market forecasts;
c. demonstrate the application of formal tools for setting capital market expectations, including statistical tools, discounted cash flow models, the risk premium approach, and financial equilibrium models;
d. explain the use of survey and panel methods and judgment in setting capital market expectations;
e. discuss the inventory and business cycles, the impact of consumer and business spending, and monetary and fiscal policy on the business cycle;
f. discuss the impact that the phases of the business cycle have on short-term/long-term capital market returns;
g. explain the relationship of inflation to the business cycle and the implications of inflation for cash, bonds, equity, and real estate returns;
h. demonstrate the use of the Taylor rule to predict central bank behavior;
i. evaluate 1) the shape of the yield curve as an economic predictor and 2) the relationship between the yield curve and fiscal and monetary policy;
j. identify and interpret the components of economic growth trends and demonstrate the application of economic growth trend analysis to the formulation of capital market expectations;
k. explain how exogenous shocks may affect economic growth trends;
l. identify and interpret macroeconomic, interest rate, and exchange rate linkages between economies;
m. discuss the risks faced by investors in emerging-market securities and the country risk analysis techniques used to evaluate emerging market economies;
n. compare the major approaches to economic forecasting;
o. demonstrate the use of economic information in forecasting asset class returns;
p. explain how economic and competitive factors can affect investment markets, sectors, and specific securities;
q. discuss the relative advantages and limitations of the major approaches to forecasting exchange rates;
r. recommend and justify changes in the component weights of a global investment portfolio based on trends and expected changes in macroeconomic factors.

Answer Question 9-A on This Page

Note: Consider *each* reform independently.

Reform/Component	**Determine** the *most likely* effect (decrease or increase) of: (circle one)	**Justify** *each* response.
i. Reform 1 on growth from capital inputs.	decrease increase	The pension reform increases the maximum tax-deductible amounts, which should result in more contributions to retirement plans. This increase in savings should produce higher capital formation, thus increasing growth from capital inputs.
ii. Reform 2 on growth in the actual labor force participation rate.	decrease increase	The new labor policy to introduce mandatory paid childcare leave is most likely to increase growth in the actual labor force participation rate. A larger proportion of the potential working population will remain in the labor force rather than exiting when children are born.

Answer Question 9-B on This Page

9-B. **Support**, with *two* reasons based on Chadhuri's forecasts, his concern that an output gap is emerging.

An output gap is the difference between the value of GDP estimated as if the economy were on its trend growth path and the actual value of GDP. Chadhuri's assessment that an output gap is emerging in the Indusi economy is supported by two factors based on his forecasts. First, Chadhuri forecasts real GDP to decline by 0.15%. Although trend real GDP is not provided, it can be inferred that negative real GDP growth would be below potential output (trend real GDP), which indicates an output gap. Second, Chadhuri expects inflation to decline to 0.25%, compared to the most-recent historical inflation rate of 0.75%. A decline in inflation is typically associated with an output gap.

Answer Question 9-C on This Page

9-C. **Explain** how Chadhuri's forecasts are consistent with the permanent income hypothesis.

Chadhuri's economic forecasts are consistent with the permanent income hypothesis. This hypothesis asserts that consumers' spending behavior is largely determined by their long-run income expectations. Consequently, short-term economic fluctuations are less likely to affect consumer spending (although likely to affect consumer savings). His forecasts – that real GDP growth will be negative, but consumer spending growth will be positive – are consistent with spending behavior being little affected by the short-term decline in GDP.

Answer Question 9-D on This Page

Determine, based on Chadhuri's forecasts, whether Yang should decrease, not change, or increase the Balanced Fund's tactical allocation to government bonds. (circle one)	**Justify** your response with *two* reasons.
decrease not change increase	1. Chadhuri's GDP forecast compared to consensus suggest slowing economic growth, which should be positive for government bonds over the near term. 2. Chadhuri's inflation forecast is lower than consensus, which should be positive for government bonds over the near term.

LEVEL III

Question: #10
Topic: Behavioral Finance
Minutes: 16

Reading References:

5 – "The Behavioral Finance Perspective," by Michael M. Pompian, CFA
6 – "The Behavioral Biases of Individuals," by Michael M. Pompian, CFA

Reading # 5 LOS:
The candidate should be able to:

a. contrast traditional and behavioral finance perspectives on investor decision making;

b. contrast expected utility and prospect theories of investment decision making;
c. discuss the effect that cognitive limitations and bounded rationality may have on investment decision making;
d. compare traditional and behavioral finance perspectives on portfolio construction and the behavior of capital markets.

Reading # 6 LOS:
The candidate should be able to:
a. distinguish between cognitive errors and emotional biases;
b. discuss commonly recognized behavioral biases and their implications for financial decision making;
c. identify and evaluate an individual's behavioral biases;
d. evaluate how behavioral biases affect investment policy and asset allocation decisions and recommend approaches to mitigate their effects.

Answer Question 10-A on This Page

10-A. **Explain** why *each* of the following is consistent with bounded rationality:

i. Corbett's new asset allocation

Corbett's behavior is consistent with bounded rationality because, given her age and current portfolio allocation, it is reasonable to decrease her equity exposure and increase her fixed income exposure. She is using a heuristic or rule-of-thumb in deciding to allocate exactly 50% of her portfolio to fixed income. Her decision is not completely rational as it does not consider circumstances such as wealth endowment, utility function, future earnings stream, or future income needs.

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ii. Corbett's choice of mutual fund company

Corbett is satisficing, a form of bounded rationality, by choosing to continue using her current investment company because it satisfies her requirements of convenience, good reputation, and fund variety. She did not behave completely rationally in deciding to remain with Van Gogh Funds as she only briefly considered other investment providers. Her choice is not necessarily optimal because there may be other companies providing more convenience, a superior reputation, and a greater variety of funds.

Answer Question 10-B on This Page

Determine, assuming Jung's bias conclusion is correct, whether Corbett would *most likely* remain with Van Gogh or switch to Infinity. (circle one)	**Justify** your response with *two* reasons.
remain with Van Gogh	1. Availability bias leads to selection of alternatives that are easily retrievable. Since Van Gogh is well-known and Infinity is less well-known, Van Gogh is more likely to be retrievable and thus selected by Corbett.
	2. Availability bias leads to selecting an alternative that has greater resonance with the decision maker. Because Corbett already invests with Van Gogh, that fund family has greater resonance with her, and is therefore more likely to be selected.
switch to Infinity	3. Because Corbett's portfolio has always been invested in Van Gogh mutual funds, this could indicate she has a narrow range of experience. A narrow range of experience is a source of availability bias that would most likely lead Corbett to remain with Van Gogh.

Answer Question 10-C on This Page

Recommend, assuming Jung's bias conclusion is correct, whether he should moderate or adapt to Corbett's behavioral biases. (circle one)	**Justify** your recommendation with *two* reasons.
moderate	1. Corbett's dominant behavioral biases are emotional which are more difficult to moderate, correct, or educate. Thus, it would be more appropriate to adapt her portfolio to her biases.
adapt	2. Corbett has a high level of wealth relative to her level of spending (low standard of living risk). Adapting her portfolio to her biases would not materially increase the likelihood of outliving her assets. A deviation from the optimal or ideal portfolio can be allowed because greater downside risk or lower returns can be tolerated.