

LEVEL III

Question: 1
Topic: Individual PM/Behavioral
Minutes: 15

Reading References:

2011 Level III, Volume 2, Study Session 3, Reading 7, pp. 5–12
“Heuristic-Driven Bias: The First Theme,” *Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing*, Hersh Shefrin (Oxford University School Press, 2002)

2011 Level III, Volume 2, Study Session 3, Reading 8, pp13–20
“Frame Dependence: The Second Theme,” *Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing*, Hersh Shefrin (Oxford University School Press, 2002)

2011 Level III, Volume 2, Study Session 4, Reading 16, pp. 246–250
“Estate Planning in a Global Context,” Stephen M. Horan, CFA, and Thomas R. Robinson, CFA (CFA Institute, 2009).

LOS:

2011-III-3-7-a

7. “Heuristic-Driven Bias: The First Theme”

The candidate should be able to

- a) **evaluate the impact of heuristic-driven biases (including representativeness, overconfidence, anchoring-and-adjustment, aversion to ambiguity) on investment decision making.**

2011-III-3-8-a

8. “Frame Dependence: The Second Theme”

The candidate should be able to:

- a) **explain how loss aversion can result in investors’ willingness to hold on to deteriorating investment positions;**
- b) evaluate the impacts that the emotional frames of self-control, regret minimization, and money illusion have on investor behavior.

2010-III-4-16-a, b, f, g

16. “Estate Planning in a Global Context”

The candidate should be able to:

- a) **discuss the purpose of estate planning and explain the basic concepts of domestic estate planning, including estates, wills, and probate;**
- b) **explain the two principal forms of wealth transfer taxes and discuss the impact of important non-tax issues, such as legal system, forced heirship, and marital property regime;**
- c) determine a family’s core capital and excess capital, based on mortality probabilities and Monte Carlo analysis;

LEVEL III

Question: 1
Topic: Individual PM/Behavioral
Minutes: 15

- d) evaluate the relative after-tax value of lifetime gifts and testamentary bequests;
- e) explain the estate planning benefit of making lifetime gifts when gift taxes are paid by the donor, rather than the recipient;
- f) evaluate the after-tax benefits of basic estate planning strategies, including generation skipping, spousal exemptions, valuation discounts, and charitable gifts;**
- g) explain the basic structure of a trust and discuss the differences between revocable and irrevocable trusts;**
- h) explain how life insurance can be a tax-efficient means of wealth transfer;
- i) discuss the two principal systems (source jurisdiction and residence jurisdiction) for establishing a country's tax jurisdiction;
- j) discuss the possible income and estate tax consequences of foreign situated assets and foreign-sourced income;
- k) evaluate a client's tax liability under each of three basic methods (credit, exemption, and deduction) that a country may use to provide relief from double taxation;
- l) describe the impact of increasing international transparency and information exchange on international estate planning.

LEVEL III

Question: 1
Topic: Individual PM/Behavioral
Minutes: 15

Guideline Answer:

PART A

Template for Question 1-A

Note: Consider *each* objective independently.

Objective	Determine which trust (irrevocable, revocable, or both equally) is more appropriate for <i>each</i> objective. (circle one)	Justify your response with <i>one</i> reason for <i>each</i> objective.
1. Sell USD 1.0 million of Buildco shares while minimizing total taxes.	irrevocable <div style="border: 1px solid black; border-radius: 50%; width: 100px; height: 30px; margin: 10px auto; display: flex; align-items: center; justify-content: center;"> revocable </div> both equally	Becker should sell the shares in the revocable trust. Current taxes on realized capital gains will be the same for either trust (20% × USD 1.8 million). Assets in the irrevocable trust are not subject to estate tax. Assets in the revocable trust are subject to estate taxes upon Becker’s death, at which time the cost basis will be increased to market value. Thus, total taxes are minimized by selling from the revocable trust.
2. Put additional assets into a trust to protect those assets from potential future legal claims against Becker.	<div style="border: 1px solid black; border-radius: 50%; width: 100px; height: 30px; margin: 10px auto; display: flex; align-items: center; justify-content: center;"> irrevocable </div> revocable both equally	Becker remains the owner of revocable trust assets. These would be at legal risk if a claim were made against him. Irrevocable trust assets are no longer owned by the settlor and hence are out of the reach of any claimants.

LEVEL III

Question: 1
Topic: Individual PM/Behavioral
Minutes: 15

PART B

Template for Question 1-B

Note: Consider *each* bias independently. Use each discussion only *once*.

Behavioral bias	Identify the discussion in which one of the participants <i>best</i> illustrates <i>each</i> of the following behavioral biases (circle the discussion number from Exhibit 1).	Justify <i>each</i> response with <i>one</i> reason.
i. representativeness	<p style="text-align: center;">1 <input checked="" type="radio"/> 2 3 4</p>	<p>Representativeness refers to judgments based on stereotypes. Becker may be overly optimistic that Rolling Mix Cement shares will perform well because the CEO of Rolling Mix Cement performed well at Buildco.</p>
ii. frame dependence	<p style="text-align: center;">1 2 3 <input checked="" type="radio"/> 4</p>	<p>Frame dependence refers to investor behavior that depends on the way decisions are framed. Becker holds many positions valued below cost. This may be evidence of frame dependence (loss aversion). His investment decisions are framed to avoid losses rather than continuously reevaluate holdings.</p>
iii. aversion to ambiguity	<p style="text-align: center;"><input checked="" type="radio"/> 1 2 3 4</p>	<p>People prefer the familiar to the unfamiliar. Frost prefers the certainty of bond cash flows to the uncertainty of risky asset cash flows, even though investors might receive appropriately higher returns for assuming that risk.</p>

LEVEL III

Question: 2
Topic: Individual PM
Minutes: 23

Reading References:

2011 Level III, Volume 2, Study Session 4, Reading 14, pp. 97–167
“Managing Individual Investor Portfolios,” Ch. 2, James W. Bronson, Matthew H. Scanlan, and Jan R. Squires, *Managing Investment Portfolios: A Dynamic Process*, 3rd edition (CFA Institute, 2007).

LOS: 2011-III-4-14-a, j, k, l, n

14. “Managing Individual Investor Portfolios”

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;
- c) compare and contrast the traditional finance and behavioral finance models of investor decision making;
- d) explain the influence of investor psychology on risk tolerance and investment choices;
- e) explain the use of a personality typing questionnaire for identifying an investor’s personality type;
- f) compare and contrast risk attitudes and decision-making styles among distinct investor personality types, including cautious, methodical, spontaneous, and individualistic investors;
- g) explain the potential benefits, for both clients and investment advisers, of having a formal investment policy statement;
- h) explain the process involved in creating an investment policy statement;
- i) distinguish between required return and desired return and explain the impact these have on the individual investor’s investment policy;
- j) **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;**
- k) **identify and explain each of the major constraint categories included in an individual investor’s investment policy statement;**
- l) **formulate and justify an investment policy statement for an individual investor;**
- m) determine the strategic asset allocation that is most appropriate for an individual investor’s specific investment objectives and constraints;
- n) **compare and contrast traditional deterministic versus Monte Carlo approaches to retirement planning and explain the advantages of a Monte Carlo approach.**

LEVEL III

Question: 2
Topic: Individual PM
Minutes: 23

Guideline Answer:

PART A

The after-tax nominal rate of return required for the Beckers' first year of retirement is calculated by dividing the Year 1 Net Required Cash Flow by the Beginning of Year 1 Net Investable Assets, and then adjusting for expected inflation.

Cash Flows	Year 1 of Retirement
Michael's after-tax company pension	\$48,000
Living expenses (250,000 × 1.03 inflation)	<u>-257,500</u>
Year 1 Net required cash flow	-\$209,500
Net Investable Assets	
Inheritance	\$8,000,000
Mortgage debt repayment	-3,500,000
Consumer debt repayment	<u>-150,000</u>
Investable asset base (beginning Year 1)	\$4,350,000
Return Objective	
Year 1 after-tax required cash flow	<u>\$209,500</u>
Divided by investable asset base	\$4,350,000
Equals after-tax real return	4.82%
Plus expected inflation	3.00%
Equals after-tax nominal rate of return	7.82%
or geometrically { (1.0482)(1.03) – 1 }	7.96%

LEVEL III

Question: 2
Topic: Individual PM
Minutes: 23

PART B

There are several factors that decrease the Becker's risk tolerance:

- The Beckers, being retired, are in the maintenance stage of life. They do not intend to work; no additional income flows are expected.
- Michael Becker has a small pension relative to living expenses. The Beckers must depend primarily on their investment portfolio.
- The Beckers have a high level of spending relative to investable assets, making them less able to tolerate volatility and negative short-term returns.
- The Beckers want their portfolio to be invested conservatively (low willingness to take risk).
- The Beckers inherited their wealth (passive source of wealth), which may result in a reduced willingness to take risk.

PART C

i. Liquidity:

The Beckers have USD 3,650,000 immediate cash needs for debt repayments plus USD 209,500 in net living expenses for the first year of retirement (USD 257,500 – USD 48,000 Michael's annual pension), or a total of USD 3,859,500. Ongoing liquidity needs will be USD 209,500 adjusted for inflation.

ii. Time horizon:

The Beckers are retiring at a young age, and do not expect expenses to change until one of them dies. Therefore, their time horizon is long-term, two-stage: (1) when they are both alive, and (2) after one of them dies.

The Beckers' time horizon may also be considered long-term, three-stage. In this case, their beginning liquidity needs are the first stage. The second and third stages would be the remainder of their lives as noted above.

LEVEL III

Question: 2
Topic: Individual PM
Minutes: 23

PART D

i.

Portfolio A will better allow the Beckers to achieve their primary financial goal of maintaining their living standard until both have died. This is because the portfolio has a higher probability of achieving a positive terminal value.

ii.

1. Frost should incorporate expected capital market assumptions into her simulation. Historical data may not fully reflect the range of possible future investment returns. Historical data also may include unlikely outliers.
2. Frost should model the performance of the portfolio's specific assets rather than the performance of its asset classes. The portfolio's performance and risk may differ from asset class performance and risk. Asset class simulation could also exclude important aspects of asset-specific investment returns such as fees and tax efficiencies.

LEVEL III

Question: 3
Topic: Institutional Portfolio Management
Minutes: 26

Reading References:

2011 Level III, Volume 2, Study Session 5, Reading 20
“Managing Institutional Investor Portfolios,” Ch. 3, R. Charles Tschampion, Laurence B. Siegel, Dean J. Takahashi, and John L. Maginn, *Managing Investment Portfolios: A Dynamic Process*, 3rd edition (CFA Institute, 2007).

LOS: 2011-III-5-20-h, i, j, l, m, n

20. “Managing Institutional Investor Portfolios”

The candidate should be able to

- a) contrast a defined-benefit plan to a defined-contribution plan, from the perspective of the employee and employer and discuss the advantages and disadvantages of each;
- 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) formulate an investment policy statement for a defined-benefit plan;
- e) evaluate the risk management considerations in investing pension plan assets;
- f) formulate an investment policy statement for a 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, source of funds, and annual spending requirements;**
- i) compare and contrast the investment objectives and constraints of foundations, endowments, insurance companies, and banks;**
- j) formulate an investment policy statement for a foundation, an endowment, an insurance company, and a bank;**
- k) contrast investment companies, commodity pools, and hedge funds to other types of institutional investors;
- l) discuss the factors that determine investment policy for pension funds, foundations, endowments, life and nonlife insurance companies, and banks;**
- m) compare and contrast the asset/liability management needs of pension funds, foundations, endowments, insurance companies, and banks;**
- n) compare and contrast the investment objectives and constraints of institutional investors given relevant data, such as descriptions of their financial circumstances and attitudes toward risk.**

LEVEL III

Question: 3
Topic: Institutional Portfolio Management
Minutes: 26

Guideline Answer:

PART A

- i. The return objective for the WU endowment is to earn a rate of return sufficient to maintain the real value of its assets and to support 25% of the university's annual operating expenses.
- ii. The required rate of return for the WU endowment combines the 5% spending rate, the higher education inflation rate of 4%, and annual management expense of 0.55%.

Calculated using a multiplicative formulation; the required return is:

$$[(1.05) \times (1.04) \times (1.0055)] - 1 = 0.09801 \text{ or } 9.80\%$$

OR by the arithmetic formulation:

$$(0.05) + (0.04) + (0.0055) = 0.0955 \text{ or } 9.55\%$$

LEVEL III

Question: 3
Topic: Institutional Portfolio Management
Minutes: 26

PART B

Template for Question 3-B

Note: Consider *each* factor independently.

Factor	<p>Determine how a change in <i>each</i> of the factors, holding all else constant, affects the risk tolerance (increases, decreases, does not change) for the WU endowment. (circle one)</p>	<p>Justify <i>each</i> response with <i>one</i> reason.</p>
i. private donations	<p>increases</p> <p>decreases</p> <p>does not change</p>	<p>Increases risk tolerance: External funding (including private donations) is a source of liquidity. As donations <u>increase</u>, a lower proportion of invested assets is required to meet current spending needs, and the endowment can assume greater risk.</p> <p>Decreases risk tolerance: As donations <u>decrease</u>, a higher proportion of invested assets is required to meet current spending needs, and the endowment must assume lower risk.</p>
ii. expected inflation	<p>increases</p> <p>decreases</p> <p>does not change</p>	<p>Increases risk tolerance: An increase in expected inflation may cause the endowment to demand a higher real return on investments to compensate for a perceived increase in risk. This can lead to an increase in expected long-term real returns for the portfolio. As expected real returns increase, with the nominal spending rule held constant, the risk tolerance of the endowment increases.</p> <p>Decreases risk tolerance: An increase in expected inflation may cause the endowment to use inflation hedges, or to hold more liquid assets in the portfolio to meet expected increased spending needs. This reduction in risk exposure may be considered a reduction in risk tolerance.</p>

LEVEL III

Question: 3
Topic: Institutional Portfolio Management
Minutes: 26

PART C

- i. The liquidity constraint is defined by the endowment's current spending need. This is 5% of the beginning of period market value of the asset portfolio, or 25% of WU's operating expenses. For the current year, the endowment's liquidity needs are USD 37.5 million. (Management fees of 0.55% can also be considered liquidity needs, increasing required spending to 5.55% of beginning of period market value of the asset portfolio, or USD 41.625 million.)
- ii. The WU endowment fund has a long-term time horizon as its goal is to maintain the real value the endowment in perpetuity.

LEVEL III

Question: 3
Topic: Institutional Portfolio Management
Minutes: 26

PART D

Template for Question 3-D

Determine which <i>one</i> of Bergen's strategic actions is:	Bergen's strategic actions (circle one)	Justify <i>each</i> response with <i>one</i> reason.
i. <i>least likely</i> to assist the endowment in achieving its primary goal.	1 2 <u>3</u>	Revising the portfolio's asset allocation to decrease its risk reduces the expected return on the asset portfolio and the WU endowment will be less likely to maintain its real value over the long-term.
ii. <i>most likely</i> to reduce the volatility of the endowment's funding of WU's operating expenses.	1 <u>2</u> 3	Adopting a rolling three-year average spending rule, based on the endowment's beginning-of-year market value for the last three years, spreads or smooths the impact of a particular year, thereby reducing the volatility of the endowment's funding of WU's operating expenses.

LEVEL III

Question: 3
Topic: Institutional Portfolio Management
Minutes: 26

PART E

Factors that suggest SU may have a higher risk tolerance than WU:

1. SU's endowment has a lower relative commitment to SU's operating budget than WU's endowment to WU's operating budget (10% versus 25%). Hence, SU is less likely to face a spending obligation short-fall and, holding all else constant, suggests that SU's risk tolerance is higher than WU.
2. SU's endowment is committed to covering the SU operating deficit, but only up to its spending rule. If the operating deficit (in dollar terms) is smaller than its spending rule (in dollar terms), it will spend less. Therefore, in any period where it is required to spend less than 5%, it can accumulate real value. Given WU's secondary goal of funding 25% of the operating budget, it is less likely that WU's spending will be less than 5%.
3. SU's operating expenses are expected to grow at a slower rate than WU's, thus SU is less likely to face a spending obligation short-fall in the future and, holding all else constant, suggests that SU may have a higher risk tolerance than WU.
4. Donations have been increasing for SU and decreasing for WU. SU requires fewer liquid assets and relies less on portfolio returns to satisfy spending needs. Thus, SU's risk tolerance is higher than WU.
5. SU's investment manager is evaluated with a longer-term return metric. Hence, SU's manager has less short-term performance pressure, and is able to tolerate greater short-term volatility.
6. SU receives government funding whereas WU relies on a private funding. Therefore, SU has a more stable or reliable external funding source, resulting in a higher risk tolerance.
7. SU has a spending rule that is smoothed over a three year period versus WU's annual spending rule. A smoothed spending rule will decrease volatility in spending requirements, allowing SU to assume higher risk tolerance.

LEVEL III

Question: 4
Topic: Economics
Minutes: 23

Reading References:

2011-Level III: Volume 3; Study Session 7; Reading 24
“Equity Market Valuation,” Peter C. Stimes and Stephan E. Wilcox (CFA Institute, 2011)

LOS: 2011-III-7-24-c, d, f, g

24. “Equity Market Valuation”

The candidate should be able to:

- a. explain the terms of the Cobb-Douglas production function and demonstrate how the function can be used to model growth in real output under the assumption of constant returns to scale;
- b. evaluate the relative importance of growth in total factor productivity, in capital stock, and in labor input given relevant historical data;
- c. demonstrate the use of the Cobb-Douglas production function in obtaining a discounted dividend model estimate of the intrinsic value of an equity market;**
- d. evaluate the sensitivity of equity market value estimates to changes in assumptions;**
- e. contrast top-down and bottom-up forecasts of the earnings per share of an equity market index;
- f. explain and critique models of relative equity market valuation based upon earnings and assets;**
- g. judge whether an equity market is under-, fairly, or over-valued based on a relative equity valuation model.**

LEVEL III

Question: 4
Topic: Economics
Minutes: 23

Guideline Answer:

PART A

The Cobb-Douglas production function can be used to calculate the projected annual real GDP growth rate. The model is particularly useful in the case of developing markets where the structure of the underlying economy has experienced, and may continue to experience, fundamental changes. One assumption of the model is that the production function exhibits constant returns to scale (i.e., a given percentage increase in capital stock and labor input results in an equal percentage increase in output).

Projected annual real GDP growth rate = growth in Total Factor Productivity (TFP) + {(Output Elasticity of Capital) × (Growth in Capital Stock)} + {(1 – Output Elasticity of Capital) × (Growth in Labor Input)}

For the projected annual real GDP growth rate = $2.8\% + (0.4 \times 3.6\%) + (0.6 \times 2.2\%)$
= $2.8\% + 1.44\% + 1.32\%$
= 5.56% or 5.6%

LEVEL III

Question: 4
Topic: Economics
Minutes: 23

PART B

Template for Question 4-B

Note: No calculations are required. Consider *each* action independently.

Action	Determine the <i>initial</i> effect (increase, decrease, or no change) <i>each</i> action would most likely have on the country's GDP growth trend. (circle one)	Justify <i>each</i> response with <i>one</i> reason.
1. Issue new regulations to reduce environmental pollution by manufacturers.	<p>increase</p> <p style="text-align: center;"><input checked="" type="radio"/> decrease</p> <p>no change</p>	Total Fixed Costs increase as a result of the new regulations. This will lead to lower levels of production and lower growth rates of GDP in the short- to medium-term. However, in the long run, there are no fixed costs. As retro-fitting is completed and obsolete plants and machinery are replaced, a new equilibrium will be established.
2. Decrease the minimum retirement age by three years for all workers.	<p>increase</p> <p style="text-align: center;"><input checked="" type="radio"/> decrease</p> <p>no change</p>	Decreasing the minimum retirement age will initially decrease labor participation and therefore the growth in labor input. This directly decreases the GDP growth trend.

LEVEL III

Question: 4
Topic: Economics
Minutes: 23

PART C

In the H-Model, the dividend growth rate g_S , is expected to decline linearly over a finite horizon, towards a sustainable rate g_L . It incorporates a growth rate in dividends “ g_S ” that is expected to prevail in the initial period of years, N , and then decline linearly to a long-term dividend growth rate “ g_L ”. g_L is expected to prevail to perpetuity from the end of period N . Inputs also include the initial annual dividend at time zero, D_0 , and a discount rate to perpetuity of r .

$$\text{Implied Price Level } (V_0) = [D_0 / (r - g_L)] [(1 + g_L) + (N/2) (g_S - g_L)]$$

Where D_0 = initial annualized dividend rate at time zero

Where g_S = dividend growth rate in initial period, N

Where g_L = long-term dividend growth rate (in perpetuity) starting at the end of period N

Where r = discount rate in perpetuity

$$V_0 = [(10 / (0.055 - 0.03)) [(1 + 0.03) + (15 / 2) (0.06 - 0.03)]$$

$$V_0 = 400 [1.03 + 7.5 (0.03)]$$

$$V_0 = 400 (1.255) = 502$$

Based on the H-Model, the estimated intrinsic value of the country’s broad equity index is 502.

PART D

Two factors not included in the Fed Model but included in the Yardeni Model are:

1. The equity risk premium.
2. Earnings growth.

The Yardeni Model attempts to address the equity risk premium by including the yield on risky debt (credit spread on A-rated bonds). While including a credit risk premium may improve upon the Fed Model, this approach does not accurately address the equity risk premium.

The Yardeni Model includes a long-term earnings growth forecast, which does accurately address the earnings growth.

LEVEL III

Question: 4
Topic: Economics
Minutes: 23

PART E

Template for Question 4-E

<p>Model</p>	<p>Determine, using the data in Exhibit 2, if the broad equity market is overvalued, fairly valued, or undervalued according to the models indicated. (circle one)</p>	<p>Justify <i>each</i> response with <i>one</i> reason. Show your calculations.</p>
<p>i. Fed Model</p>	<p style="text-align: center;"> overvalued fairly valued undervalued </p>	<p>The Fed model assumes that a market is fairly valued when the yield on long-term government debt, Y_{govt} equals the forward equity-index earnings yield, Y_{eqty}. In this case, the forward equity-index earnings yield is lower than the long-term government bond yield; therefore the equity market is overvalued.</p> <p>In this case:</p> <ul style="list-style-type: none"> • The long-term government bond yield (Y_{govt}) equals 4.05% • The forward equity index earnings yield (Y_{eqty}) equals 3.95% <p>$Y_{eqty} < Y_{govt}$ Therefore, based on the Fed model, the broad equity market is overvalued.</p>

LEVEL III

Question: 4
Topic: Economics
Minutes: 23

Template for Question 4-E (continued)

<p>Model</p>	<p>Determine, using the data in Exhibit 2, if the broad equity market is overvalued, fairly valued, or undervalued according to the models indicated. (circle one)</p>	<p>Justify <i>each</i> response with <i>one</i> reason. Show your calculations.</p>
<p>ii. Yardeni Model</p>	<p>overvalued</p> <p style="text-align: center;">(fairly valued)</p> <p>undervalued</p>	<p>The Yardeni model assumes that a market is fairly valued when the justified forward earnings yield, Y_{eqty} is equal to the forward equity index earnings yield value implied by current equity market index values (using consensus forward earnings estimates). The Yardeni model defines the justified forward earnings yield as the long-term corporate bond yield, Y_{corp}, minus the weighted long-term earnings growth rate, $d \times \text{LTEG}$ (the weighting, d, is based on the market).</p> <p>In this case:</p> <ul style="list-style-type: none"> • The forward equity index earnings yield value implied by current equity market index values (Y_{eqty}) equals 3.95%. • The long-term corporate bond yield (Y_{corp}) minus the weighted long-term earnings growth rate ($d \times \text{LTEG}$) equals 3.95%, $4.70\% - (0.10 \times 7.5\%) = 3.95\%$. <p>Since $(Y_{\text{eqty}}) = (Y_{\text{corp}}) - (d \times \text{LTEG})$, the Yardeni model would conclude that the equity market is fairly valued.</p>

LEVEL III

Question: 5
Topic: Asset Allocation
Minutes: 20

Reading References:

2011 Level III, Volume 3, Study Session 8, Reading 26.
“Asset Allocation,” Ch. 5, William F. Sharpe, Peng Chen, Jerald E. Pinto, and Dennis W. McLeavey, *Managing Investment Portfolios: A Dynamic Process*, 3rd edition (CFA Institute, 2007).

LOS: 2010-III-8-26-d, l, and o.

26. “Asset Allocation”

The candidate should be able to

- a) summarize 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 and contrast strategic and tactical asset allocation;
- c) appraise 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) formulate and implement the major steps in asset allocation;
- l) 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;**
- m) discuss the structure of the minimum-variance frontier with a constraint against short sales;
- n) formulate and justify a strategic asset allocation, given an investment policy statement and capital market expectations;
- o) contrast the characteristic issues relating to asset allocation for individual investors versus institutional investors and critique a proposed asset allocation in light of those issues;**
- p) formulate and justify tactical asset allocation (TAA) adjustments to strategic asset class weights, given a TAA strategy and expectational data.

LEVEL III

Question: 5
Topic: Asset Allocation
Minutes: 20

Guideline Answer:

PART A

i. Advantages of using a resampled efficient frontier:

The resampled efficient frontier approach generates portfolios that are more stable through time than those derived using standard mean-variance optimization (MVO). Finnegan stated that she was dissatisfied with the high level of turnover and transaction costs she incurred in her portfolio using standard MVO. A portfolio that is more stable would reduce turnover and transaction costs, and be more appropriate for Finnegan.

The resampled efficient frontier approach generates portfolios that are more diversified than those derived using standard MVO. Finnegan stated that she has below-average risk tolerance until she finds a new job. A more diversified portfolio should be less volatile, meeting Finnegan's lower risk tolerance requirement.

ii. Advantages of using the Black-Litterman approach:

The Black-Litterman (BL) approach incorporates the investor's views. Finnegan has a positive view of the European retail clothing sector. The BL approach allows her to incorporate these views, while standard MVO does not.

The BL approach generates portfolios that are more diversified than those derived using standard MVO. Finnegan stated that she has below-average risk tolerance until she finds a new job. A more diversified portfolio should be less volatile, meeting Finnegan's lower risk tolerance requirement.

iii. Advantages of using a Monte-Carlo simulation:

Monte Carlo simulations allow for portfolio rebalancing under changing tax rates and in multi-period situations. Finnegan's effective tax rate will likely increase sharply when she starts a new job. MVO does not consider these factors.

Monte Carlo simulations can compute path-dependent terminal wealth. Finnegan hopes to make a deposit on a home for her sister within the year, provided she finds a new job. Cash flows in and out of a portfolio and the sequence of returns will have a material effect on terminal wealth – this is termed path-dependent. In Finnegan's case, the deposit would be a significant cash outflow, resulting in lower terminal wealth.

LEVEL III

Question: 5
Topic: Asset Allocation
Minutes: 20

PART B

The ALM approach focuses asset allocation on funding liabilities. Finnegan should adopt an ALM approach because:

- Finnegan faces a significant penalty for not meeting her liabilities. If she misses her mortgage payments for three or more months, she risks losing her home. She does not want to sell assets to pay the mortgage. Therefore, a portfolio structure designed to meet liabilities would be appropriate.
- Finnegan has below average risk tolerance while unemployed. Loss averse investors, or investors with below-average risk tolerance, are better suited to an ALM approach than to an AO approach.
- Finnegan's mortgage payments are interest-rate sensitive. Holding investment assets with similarly sensitive cash flows would hedge this risk. Therefore, an ALM approach is more appropriate than an AO approach for her.

PART C

Finnegan should have a lower allocation to equities because:

- Finnegan is young and has a large amount of human capital relative to her financial capital.
- The correlation between Finnegan's income and the equity market's performance is high. Thus, her overall allocation to "equity like" capital is extremely high. Investors whose human capital is highly correlated with equity returns should balance human capital risk through a lower allocation to equities in their investment portfolios.

Level III

Question: 6
Topic: Fixed Income
Minutes: 19

Reading References:

2011 Level III, Volume 4, Study Session 9, Reading 28
“Fixed-Income Portfolio Management-Part I,” Ch. 6, sections 1–4 (pp. 1–40), H. Gifford Fong and Larry D. Guin, *Managing Investment Portfolios: A Dynamic Process*, 3rd edition (CFA Institute, 2007).

2011 Level III, Volume 4, Study Session 9, Reading 29
“Relative-Value Methodologies for Global Credit Bond Portfolio Management,” Ch. 5, Jack Malvey, *Fixed Income Readings for the Chartered Financial Analyst® Program*, 2nd edition (CFA Institute, 2005).

LOS:

2011-III-9-28-d, g

28. “Fixed-Income Portfolio Management-Part I”

The candidate should be able to:

- a) compare and contrast, with respect to investment objectives, the use of liabilities as a benchmark and the use of a bond index as a benchmark;
- b) compare and contrast pure bond indexing, enhanced indexing, and active investing with respect to the objectives, techniques, advantages, and disadvantages of each;
- c) discuss the criteria for selecting a benchmark bond index and justify the selection of a specific index when given a description of an investor’s risk aversion, income needs, and liabilities;
- d) review and justify the techniques, such as duration matching and the use of key rate durations, by which an enhanced indexer may seek to align the risk exposures of the portfolio with those of the benchmark bond index;**
- e) contrast and illustrate the use of total return analysis and scenario analysis to assess the risk and return characteristics of a proposed trade.
- f) design a bond immunization strategy to ensure funding of a predetermined liability and evaluate the strategy under various interest rate scenarios;
- g) demonstrate the process of rebalancing a portfolio to re-establish a desired dollar duration;**
- h) explain the importance of spread duration;
- i) discuss the extensions that have been made to classical immunization theory, including the introduction of contingent immunization;
- j) explain the risks associated with managing a portfolio against a liability structure, including interest rate risk, contingent claim risk, and cap risk;
- k) compare and contrast immunization strategies for a single liability, multiple liabilities, and general cash flows;
- l) compare and contrast risk minimization with return maximization in immunized portfolios;

- m) demonstrate the use of cash flow matching to fund a fixed set of future liabilities and contrast the advantages and disadvantages of cash flow matching to those of immunization strategies.

2011-III-9-29-d, e

29. “Relative-Value Methodologies for Global Credit Bond Portfolio Management”

The candidate should be able to:

- a) explain classic relative-value analysis, based on top-down and bottom-up approaches to credit bond portfolio management;
- b) discuss the implications of cyclical supply and demand changes in the primary corporate bond market and the impact of secular changes in the market’s dominant product structures;
- c) summarize the influence of investors’ short- and long-term liquidity needs on portfolio management decisions;
- d) **discuss common rationales for secondary market trading, including yield-spread pickup trades, credit-upside trades, credit-defense trades, new-issue swaps, sector-rotation trades, yield curve–adjustment trades, structure trades, and cash flow reinvestment;**
- e) **discuss and evaluate corporate bond portfolio strategies that are based on relative value, including total return analysis, primary market analysis, liquidity and trading analysis, secondary trading rationales and trading constraints, spread analysis, structure analysis, credit curve analysis, credit analysis, and asset allocation/sector analysis.**

Level III

Question: 6
Topic: Fixed Income
Minutes: 19

Guideline Answer:

PART A

i.

The rebalancing ratio is the beginning of year dollar duration of the portfolio divided by the end of year dollar duration of the portfolio minus 1. It indicates the percentage amount that each bond position needs to be changed in order to rebalance the portfolio.

The beginning of year dollar duration of the government bond ($\$D_0$) portfolio equals \$166,230.

Beginning of Year Dollar Duration ($\$D_0$)

Portfolio:	Price	Duration	Market Value	Dollar Duration
Bond 1	94.50	4.9	\$ 945,000	\$ 46,305
Bond 2	90.00	7.0	\$900,000	\$ 63,000
Bond 3	103.50	5.5	\$1,035,000	\$ 56,925
			\$2,880,000	\$ 166,230

where:

Dollar duration = (Market value of bond) \times (Bond duration) \times (Par value of bond) \times (0.01)

For example for Bond 1, the dollar duration = $0.9450 \times 4.9 \times \$1,000,000 \times 0.01 = \text{USD } 46,305$.

The end of year dollar duration of the government bond portfolio ($\$D_1$) equals \$150,010.

End of Year Dollar Duration ($\$D_1$)

Portfolio:	Price	Duration	Market Value	Dollar Duration
Bond 1	94	4.3	\$940,000	\$ 40,420
Bond 2	93	6.3	\$ 930,000	\$ 58,590
Bond 3	102	5.0	\$ 1,020,000	\$ 51,000
			\$ 2,890,000	\$ 150,010

The rebalancing ratio = $\$D_0 / \D_1
= $\$166,230 / \$150,010$
= $1.1081 - 1 = 10.81\%$.

This implies that Andrews must increase the portfolio's holdings of each bond by 10.81% to restore the dollar duration match with the pension fund's liability benchmark.

Level III

Question: 6
Topic: Fixed Income
Minutes: 19

ii.

The amount of cash required for rebalancing equals the end of year market value of the bond portfolio times the rebalancing ratio.

Cash required for rebalancing = $\$2,890,000 \times 0.1081 = \$312,409$

PART B

Wang's portfolio will most likely outperform its benchmark.

Wang's portfolio deviates from the benchmark in one parameter: sector weights. Relative to the benchmark index, his portfolio is overweight in Consumer Cyclical, underweight in Consumer Non-cyclicals and neutral in Utilities. Consumer Cyclical tend to outperform other sectors during a period of economic strength, as consumers go forward with delayed and non-essential purchases. Therefore, the returns on Wang's portfolio are expected to be higher than the benchmark portfolio returns during a period of increased economic activity, as forecast by SM Capital's economist.

The utilities sector will neither increase nor decrease portfolio returns compared to the benchmark index, because the portfolio weighting matches the index. Similarly, the other two parameters, duration and credit quality, are matched to the benchmark and thus would have no impact on relative performance.

Level III

Question: 6
Topic: Fixed Income
Minutes: 19

PART C

Template for Question 6-C

Note: Consider *each* strategy independently.

Trading strategy	Describe the trades that Wang could use (buy/sell bonds as appropriate) to implement <i>each</i> trading strategy.	Justify <i>each</i> trade, based on the economist's forecast.
1. sector rotation trades	Bonds to buy: Consumer Cyclicals	<p>A sector rotation trade is used to move out of a sector that is expected to weaken and move into a sector that is expected to strengthen.</p> <p>When there is an increase in economic activity, the Consumer Cyclicals sector tends to outperform other sectors. Consumers go forward with purchases that have been delayed and purchases of non-essential goods.</p> <p>Since the economist has forecast a significant economic improvement, an appropriate sector rotation trade for Wang would be to increase Consumer Cyclicals holdings (Wang is already overweight this sector relative to the benchmark index). Either Consumer Non-cyclicals or Utilities can be sold to fund the purchase. Given that Wang's portfolio is already underweight in Consumer Non-cyclicals relative to the benchmark index, he is more likely to reduce his exposure to Utilities, which also behave in a non-cyclical fashion.</p>
	Bonds to sell: Consumer Non-Cyclicals or Utilities	

Level III

Question: 6
Topic: Fixed Income
Minutes: 19

Template for Question 6-C (continued)

Note: Consider *each* strategy independently.

Trading strategy	Describe the trades that Wang could use (buy/sell bonds as appropriate) to implement <i>each</i> trading strategy.	Justify <i>each</i> trade, based on the economist's forecast.
2. credit adjustment trades	<p>Bonds to buy:</p> <p>Low rated bonds: BBB</p> <hr/> <p>Bonds to sell:</p> <p>High rated bonds: AA and above</p>	<p>A credit adjustment trade is designed to increase or decrease the average credit quality of the bond portfolio.</p> <p>Given the economist's strong outlook for the economy and the prospect of fewer corporate defaults, Wang should decrease the average credit quality of the portfolio. Lower quality bonds tend to outperform higher quality bonds during periods of increased economic activity.</p> <p>Therefore, Wang should engage in trades that increase the proportion of lower-rated bonds such as BBB bonds, and decrease the proportion of higher-rated bonds such as AA and above.</p>
3. yield curve adjustment trades	<p>Bonds to buy:</p> <p>Shorter duration bonds</p> <hr/> <p>Bonds to sell:</p> <p>Longer duration bonds</p>	<p>A yield curve adjustment trade is designed to capitalize on expected shifts in the yield curve.</p> <p>The economist is expecting no change in short-term interest rates and expecting long-term interest rates to rise by 200 basis points. This would decrease the value of the long duration bonds in Wang's portfolio, thereby negatively affecting total portfolio returns. The longer the maturity of a bond (other factors equal), the longer the duration of a bond. The longer the duration, the more price-sensitive a bond is to interest rate movements.</p> <p>Therefore, Wang should decrease the overall duration of the portfolio by decreasing the proportion of longer duration bonds.</p>

LEVEL III

Question: 7
Topic: Equity
Minutes: 22

Reading References:

2011 Level III, Volume 4, Study Session 12, Reading 33
“Corporate Governance,” Ch. 1, *The Theory of Corporate Finance*, Jean Tirole (Princeton University Press, 2006).

2011 Level III, Volume 4, Study Session 12, Reading 35, pp. 405-407.
“Emerging Markets Finance,” Geert Bekaert and Campbell R. Harvey, *Journal of Empirical Finance*, vol. 10, issue 5 (Elsevier, December 2003).

LOS:

2011-III-12-33-b, c, d, e

33. “Corporate Governance”

The candidate should be able to:

- a) explain the ways in which management may act that are not in the best interest of the firm’s owners (moral hazard) and illustrate how dysfunctional corporate governance can lead to moral hazard.
- b) evaluate explicit and implicit incentives that can align management’s interests with those of the firm’s shareholders;**
- c) explain the shortcomings of boards of directors as monitors of management and state and discuss prescriptions for improving board oversight;**
- d) discuss why active monitoring by investors requires control, the various mechanisms by which control is exercised, and the limitations of active monitoring;**
- e) critique the effectiveness of debt as a corporate governance mechanism;**
- f) explain the social responsibilities of the corporation in a “stakeholder society” and evaluate the advantages and disadvantages of a corporate governance structure based on stakeholder rather than shareholder interests;
- g) discuss the Cadbury Report recommendations for best practice in maintaining an effective board of directors whose interests are aligned with those of shareholders.

2011-III-12-35-c

35. “Emerging Markets Finance”

The candidate should be able to:

- a) discuss the process of financial liberalization and explain the expected impact on pricing and expected returns as a segmented market evolves into an integrated market;
- b) explain the benefits that may accrue to an emerging market economy as a result of financial liberalization;
- c) discuss the major issues confronting emerging market investors, including excess correlations during times of crisis (contagion), corporate governance, price discovery, and liquidity.**

LEVEL III

Question: 7
Topic: Equity
Minutes: 22

Guideline Answer:

PART A

The management incentive system at Orca would likely be improved by each of the following:

Recommended measures:

- Increase share-based incentives – Orca’s executive compensation system currently emphasizes cash bonuses based on one year earnings growth which encourages a short-term focus and possible manipulation of accounting data. By implementing greater share-based incentives, management will be encouraged to take a long-term perspective on shareholder value.
- Include share options as part of the compensation – Compensation in the form of share options provides a stronger incentive to increase the share price (compared with awarding straight shares), since there is a payoff only if the share price moves above the exercise price (which should be set above current market value).
- Increase implicit incentives, such as the threat of firing – These incentives appear to be weak at Orca, based on the long tenure of executive management, despite poor share price performance.
- Structure bonuses to reward Orca’s share price performance relative to the industry’s share price performance – Bonuses are currently based on earnings targets for Orca set at the beginning of the year. By indexing against the average industry share price performance, Orca managers would be rewarded for the relative performance of Orca’s share price compared to the industry and would not be penalized or rewarded for market-driven events or trends.

LEVEL III

Question: 7
Topic: Equity
Minutes: 22

PART B

The reasons that Orca's board of directors most likely does not represent the best interests of shareholders can be grouped into three main categories:

1. Lack of independence:
 - The Board Chair is also the CEO. The Chair exercises a disproportionate influence on board meetings. When the Chair is also the CEO, it could be difficult for other members of the board to effectively represent all stakeholders.
 - Manley Bank has two board seats and is a major creditor of Orca. These board members would likely be biased towards the interests of debt holders.
 - Five of the Board directors are classified as insiders. Therefore, only half the board is potentially free of conflicts of interest in representing all stakeholders. In addition, at least two of the independent directors have a vested interest in representing the interests of Manley Bank. Therefore, there are at most three truly independent directors.
2. Insufficient attention:
 - Three of Orca's independent directors are each CEOs of large publicly traded companies and directors of other boards. As such, they are likely to be unable to devote adequate attention to their Orca Board duties. In these situations, directors may be inclined to rely entirely on information provided by management.
3. Insufficient incentives:
 - Board compensation consists only of a fixed annual fee, which does not connect Board interests to shareholder interests.

PART C

Replacing debt with equity would:

- Increase Orca's liquidity by reducing the amount of regular contractual interest and principal payments. This is particularly important for Orca, since it appears to need to invest in new products and production technologies.
- Allow Orca to invest in projects that have a higher degree of risk and higher return potential since there will be less need to preserve cash for principal and interest payments.
- Improve Orca's ability to raise capital.
- Decrease the likelihood of cash shortages, defaults and bankruptcy.
- Lower the weighted average cost of capital if the company's debt is currently above the level indicated by its optimal capital structure.

LEVEL III

Question: 7
Topic: Equity
Minutes: 22

PART D

With only 4% ownership, it would be suboptimal for Horizon to acquire strategic information to challenge the firm's policies. Horizon would only receive a small portion (4%) of any increase in value for shareholders. There would be substantial free-riding on Horizon's monitoring efforts.

Since Orca's shares are highly liquid, Horizon can easily exit its investment by selling its position in the company. Investors are more likely to incur the costs of monitoring to protect their investment when a company's shares are illiquid, since investors cannot easily sell their positions.

The relatively high turnover in Horizon's funds suggests that the mutual fund company is generally not a long-term investor that might expend resources to create long-run value through monitoring.

PART E

Issuance of ADRs would likely have a positive effect on Acorn's corporate governance.

ADR issuance would:

- allow Acorn to 'opt-in' to a better external governance regime in the US.
- commit the firm to a higher level of disclosure, having to meet US disclosure rules.
- lead to increased coverage by research analysts and an increase in the quality of the research on the firm. Increased investor and media scrutiny also improves the information environment.

LEVEL III

Question: 8
Topic: Risk Management
Minutes: 16

Reading References:

2011 Level III, Volume 5, Study Session 14, Reading 39

“Risk Management,” Ch. 9, Don M. Chance, Kenneth Grant, and John Marsland, *Managing Investment Portfolios: A Dynamic Process*, 3rd edition (CFA Institute, 2007).

2011 Level III, Volume 5, Study Session 14, Reading 40

“Currency Risk Management,” Ch. 11, *Global Investments*, 6th edition, Bruno Solnik and Dennis W. McLeavey (Addison Wesley, 2009).

LOS: 2010-III-14-39-c, d, e, f, g, h

39. “Risk Management”

The candidate should be able to:

- a) compare and contrast the main features of the risk management process, risk governance, risk reduction, and an enterprise risk management system;
- b) recommend and justify the risk exposures an analyst should report as part of an enterprise risk management system;
- c) evaluate the strengths and weaknesses of a company’s risk management processes and the possible responses to a risk management problem;**
- d) evaluate a company’s or a portfolio’s exposures to financial and nonfinancial risk factors;**
- e) interpret and compute value at risk (VAR) and explain its role in measuring overall and individual position market risk;**
- f) compare and contrast the analytical (variance–covariance), historical, and Monte Carlo methods for estimating VAR and discuss the advantages and disadvantages of each;**
- g) discuss the advantages and limitations of VAR and its extensions, including cash flow at risk, earnings at risk, and tail value at risk;**
- h) compare and contrast alternative types of stress testing and discuss the advantages and disadvantages of each;**
- i) evaluate the credit risk of an investment position, including forward contract, swap, and option positions;
- j) demonstrate the use of risk budgeting, position limits, and other methods for managing market risk;
- k) demonstrate the use of exposure limits, marking to market, collateral, netting arrangements, credit standards, and credit derivatives to manage credit risk;
- l) compare and contrast the Sharpe ratio, risk-adjusted return on capital, return over maximum drawdown, and the Sortino ratio as measures of risk-adjusted performance;
- m) demonstrate the use of VAR and stress testing in setting capital requirements.

LEVEL III

Question: 8
Topic: Risk Management
Minutes: 16

LOS: 2010-III-14-40-a

40. “Currency Risk Management”

The candidate should be able to

- a) **demonstrate and explain the use of foreign exchange futures to hedge the currency exposure associated with the principal value of a foreign investment;**
- b) justify the use of a minimum-variance hedge when covariance between local currency returns and exchange rate movements exists and interpret the components of the minimum-variance hedge ratio in terms of translation risk and economic risk;
- c) evaluate the effect of basis risk on the quality of a currency hedge;
- d) evaluate the choice of contract terms (short, matched, or long term) when establishing a currency hedge;
- e) explain the issues that arise when hedging multiple currencies;
- f) discuss the use of options rather than futures/forwards to insure and hedge currency risk;
- g) evaluate the effectiveness of a standard dynamic delta hedge strategy when hedging a foreign currency position;
- h) discuss and justify other methods for managing currency exposure, including the indirect currency hedge created when futures or options are used as a substitute for the underlying investment;
- i) compare and contrast the major types of currency management strategies specified in investment policy statements.

LEVEL III

Question: 8
Topic: Risk Management
Minutes: 16

Guideline Answer:

PART A

i. Historical VaR

Use of a historical VaR model is not appropriate as it will not take into account the recent increase in the volatility of Polish equities.

ii. Analytical VaR

Use of an analytical VaR model is not appropriate, as it will not take into account that the portfolio return distribution is most likely not normal. Both the equity index options that hedge the downside risk of the portfolio and the classification of Poland as an emerging market are likely to contribute to a non-normal distribution of returns.

PART B

To determine the 1% monthly VaR using annualized data, the expected annualized return and standard deviation must first be adjusted. The expected monthly return equals $0.06 / 12 = 0.005$ and the monthly standard deviation equals $0.07 / \sqrt{12} = 0.020207$.

The 1 percent monthly portfolio VAR is $\mu_p - 2.33\sigma = 0.005 - 2.33(0.020207) = -0.042083$. Then the VaR in PLN equals $1,400,000(0.042083) = \text{PLN } 58,916,080$.

PART C

The portfolio produced a profit of PLN 400,000, calculated by converting initial and ending LHS market values to PLN, and subtracting the initial values from the ending values.

	Initial LHS Value	Initial PLN Value (Initial LHS \times 0.87)	Ending LHS Value	Ending PLN Value (Ending LHS \times .80)	Profit/Loss (PLN)
Bonds	25,000,000	21,750,000	27,500,000	22,000,000	250,000
Equities	10,000,000	8,700,000	8,000,000	6,400,000	-2,300,000
- Fwd	-35,000,000	-30,450,000	-35,000,000	-28,000,000	2,450,000
				Total Profit/Loss	400,000

LEVEL III

Question: 9
Topic: Performance Evaluation
Minutes: 16

Reading References:

2011 Level III, Volume 6, Study Session 17, Reading 46
“Evaluating Portfolio Performance,” Ch. 12, Jeffery V. Bailey, Thomas M. Richards, and David E. Tierney, *Managing Investment Portfolios: A Dynamic Process*, 3rd edition (CFA Institute, 2010)

LOS: 2011-III-17-46; LOS: k, l, and o

46. “Evaluating Portfolio Performance”

The candidate should be able to:

- a) demonstrate the importance of performance evaluation from the perspective of fund sponsors and the perspective of investment managers;
- b) explain the basic components of portfolio evaluation (performance measurement, performance attribution, and performance appraisal);
- c) calculate, interpret, and contrast time-weighted and money-weighted rates of return and discuss how each is affected by cash contributions and withdrawals;
- d) identify and explain potential data quality issues as they relate to calculating rates of return;
- e) demonstrate the analysis of portfolio returns into components attributable to the market, to style, and to active management;
- f) discuss the properties of a valid benchmark and evaluate the advantages and disadvantages of alternative types of performance benchmarks;
- g) summarize the steps involved in constructing a custom security-based benchmark;
- h) judge the validity of using manager universes as benchmarks;
- i) evaluate benchmark quality by applying tests of quality to a variety of possible benchmarks;
- j) discuss the issues that arise when assigning benchmarks to hedge funds;
- k) distinguish between macro and micro performance attribution and discuss the inputs typically required for each;**
- l) demonstrate, justify, and contrast the use of macro and micro performance attribution methodologies to evaluate the drivers of investment performance;**
- m) discuss the use of fundamental factor models in micro performance attribution;
- n) differentiate between the effect of the external interest rate environment and the effect of active management on fixed-income portfolio returns;
- o) explain the management factors that contribute to a fixed-income portfolio’s total return and interpret the results of a fixed-income performance attribution analysis;**
- p) calculate, interpret, and contrast alternative risk-adjusted performance measures, including (in their *ex post* forms) alpha, information ratio, Treynor measure, Sharpe ratio, and M^2 ;
- q) explain how a portfolio’s alpha and beta are incorporated into the information ratio, Treynor measure, and Sharpe ratio;
- r) demonstrate the use of performance quality control charts in performance appraisal;
- s) discuss the issues involved in manager continuation policy decisions, including the costs of hiring and firing investment managers;
- t) contrast Type I and Type II errors in manager continuation decisions.

LEVEL III

Question: 9
Topic: Performance Evaluation
Minutes: 16

Guideline Answer:

PART A

- i. Chin should prepare a macro performance attribution report. This is required in order for the committee to understand the overall results of the Fund compared to its benchmark, and to analyze the effects of the committee's decisions (asset allocation, manager allocation, choice of benchmarks) on the Fund.
- ii. Macro attribution analysis requires two additional inputs: policy allocations and benchmark portfolio returns. Fund sponsors determine policy allocations, or "normal" weightings for each asset class and individual manager. Fund sponsors typically determine these weightings from a review of asset/liability analysis and risk tolerance. Benchmark portfolio returns are necessary to adequately evaluate the value added by the managers. Fund sponsors may use broad market indexes as benchmarks for asset categories and the entire portfolio, and may use more focused indexes to represent a manager's investment style and mandate.

PART B

- i. The pure sector allocation return for Consumer Durables equals $(w_{pj} - w_{Bj}) \times (r_{Bj} - r_B)$.

where:

w_{pj} = Portfolio weight of sector j
 w_{Bj} = Benchmark weight of sector j
 r_{Bj} = Benchmark return of sector j
 r_B = Overall benchmark return

$$= (26.3\% - 21.9\%) \times (4.90\% - 2.80\%) = 0.092\% \text{ or nine basis points.}$$

- ii. The within-sector allocation (security selection) return for Technology equals $w_{Bj} \times (r_{pj} - r_{Bj})$.

where:

r_{pj} = Portfolio return of sector j

$$= 22.4\% \times (1.30\% - (-0.20\%)) = 0.336\% \text{ or thirty-four basis points.}$$

LEVEL III

Question: 9
Topic: Performance Evaluation
Minutes: 16

PART C
Template for Question 9-C

Statement	Conclude (yes, no, cannot determine with the information provided) whether each statement made by the managers is consistent with the data in Exhibit 2. (circle one)	Justify each response with one reason.
<p>Manager A:</p> <p>“Our strategy is to add value by actively managing the duration of the fixed income securities in the portfolio.”</p>	<p>yes</p> <p><input checked="" type="radio"/> no</p> <p>cannot determine with the information provided</p>	<p>The Interest Rate Management Effect indicates how well the manager predicts interest rate changes. It can be broken down into returns due to duration, convexity, and yield-curve shape changes.</p> <p>Manager A has generated a –0.08% return from Interest Rate Management Effect. This is inconsistent with their stated strategy. Skillful duration management suggests an ability to add value by actively managing the duration of the fixed income securities in the portfolio.</p>
<p>Manager B:</p> <p>“Our strategy is to add value by identifying undervalued securities and sectors to take advantage of bonds that are mispriced by the market.”</p>	<p><input checked="" type="radio"/> yes</p> <p>no</p> <p>cannot determine with the information provided</p>	<p>Other Management Effects consists of sector/quality, bond selectivity, and transaction costs.</p> <p>The sector/quality effect measures the manager’s ability to identify undervalued/overvalued sector/quality groups and buying/selling accordingly.</p> <p>Manager B has generated a 0.32% return from Other Management Effects which is consistent with their stated strategy to add value by identifying undervalued securities and sectors.</p>