

FinQuiz.com

CFA Level III Mock Exam 1

June, 2017

Revision 2

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FinQuiz.com – 1st Mock Exam 2017 (AM Session)

The morning session of the 2017 Level III CFA Examination has 9 questions. For grading purposes, the maximum point value for each question is equal to the number of minutes allocated to that question.

Questions	Topic	Minutes
1	Portfolio Management – Individual Investor	36
2	Portfolio Management – Institutional Investors	28
3	Portfolio Management – Economics	10
4	Portfolio Management – Asset Allocation	25
5	Portfolio Management – Fixed-Income Investments	15
6	Portfolio Management – Equity Investments	20
7	Portfolio Management – Risk Management	20
8	Portfolio Management – Monitoring and Rebalancing	17
9	Portfolio Management – Performance Evaluation and Attribution	9
Total:		180

QUESTION 1 HAS FOUR PARTS (A, B, C, D) FOR A TOTAL OF 36 MINUTES.

Simon Becker is a 45 years old stock broker at P.S. Salow, a well-respected firm with a long history. Simon is sitting down with J.D. Smithson, the advisor that manages his retirement portfolio, to plan his retirement and other needs.

Simon has done well and would like to retire in ten years. He is married and his two twin boys will soon be moving out and attending college at the same time he is starting retirement. While he does not plan on paying their entire tuition, he would like to give them a one-time gift of \$25,000 each when they move out.

Simon and his wife, who works as a medical examiner, would like to retire and buy a vacation home in Miami, which will cost about \$200,000. They currently rent a home and have no significant debts or mortgages.

The Becker's currently have an investment portfolio of \$1,250,000 in a money market account. They would like to buy an annuity for \$2,000,000 when they retire that will cover their annual expenses. While the Beckers have worked hard to fund their portfolio to this point, they do not want to contribute any more for their remaining years to retirement. While he is familiar with the concept of risk and return, Mr. Becker has seen many of his coworkers lose their entire life savings to speculative investments. He feels that he and his wife have worked hard to save up and are pretty well set for their retirement.

- A.** Formulate each of the following constraints for Mr. Becker's investment policy statement (IPS):
- i. time horizon
 - ii. unique circumstances
 - iii. liquidity

(6 minutes)

- B.** State the return objective and risk tolerance statement for Mr. Becker's IPS. Risk tolerance should include ability, willingness and an overall tolerance.

(12 minutes)

- C.** Calculate the required average annual pretax nominal rate of return for the IPS. **Show** your calculations.

(9 minutes)

Five years have passed and the Beckers have recently inherited a substantial amount of money from a relative. In addition, the Beckers have reassessed their plans in retirement and would like to live a more lavish lifestyle which will require more expenses. To accomplish this, Mr. Becker has decided to put part of their money to private equity and hedge funds.

- D.** Identify two factors that change Mr. Becker’s ability or willingness to take risk and state whether the factor increases or decreases risk tolerance.

Answer Question 1-D in the Template provided on page 5.

(10 minutes)

Template for Question 1-D

<p>Choose whether the affect is to willingness or ability to tolerate risk</p>	<p>Choose whether the affect is an increase or decrease in risk tolerance</p>	<p>Identify two factors that change Mr. Becker's risk tolerance.</p>
<p>Ability</p> <p>Willingness</p>	<p>Increase</p> <p>Decrease</p>	
<p>Ability</p> <p>Willingness</p>	<p>Increase</p> <p>Decrease</p>	

Solution for Question 1.

A Solution:

i. Time Horizon

The Beckers have a two stage time horizon; 10 years to planned retirement and children's college; then greater than 30 years in retirement.

ii. Unique Circumstances

Mr. Becker's job as a stock broker means his income may be correlated with the performance of the stock market so it may be appropriate to correlate his investment portfolio more closely with fixed income products and other safer investments.

iii. Liquidity

The Beckers have no immediate large one-time cash needs.

Reference:

CFA Level III, Volume 2, Study Session 4, Reading 8.

B Solution:

Return Objective

The Beckers would like to purchase an annuity product worth \$2,000,000 in ten years to fund their retirement expenses and buy a retirement home in Miami. They need to grow their current portfolio by enough to fund the purchase of the annuity and the retirement home, plus gift \$50,000 to their children.

Risk Tolerance

The Becker's risk tolerance is below average because of a lower than average willingness

Ability- The Becker's ability to tolerate risk is average given the size of their portfolio and low immediate needs for liquidity

Willingness- The Becker's willingness to tolerate risk is below average given Mr. Becker's statements about coworkers.

Reference:

CFA Level III, Volume 2, Study Session 4, Reading 8.

C Solution:

Investment Portfolio (pretax)	\$1,250,000
Cash Outflows at Retirement	
Gift to Children	\$50,000
Cost of Retirement Home	\$200,000
Required to Buy Annuity	<u>\$2,000,000</u>
	\$2,250,000
Required Return Calculation	
Present Value	\$1,250,000
Future Value	\$2,250,000
Annual Contribution (PMT)	\$0
Number of Years (N)	10
→Compute I/Y Pretax Nominal	6.05%

Reference:

CFA Level III, Volume 2, Study Session 4, Reading 8.

D Solution:

Template for Question 1-D

Choose whether the affect is to willingness or ability to tolerate risk	Choose whether the affect is an increase or decrease in risk tolerance	Identify two factors that change Mr. Becker's risk tolerance.
<p style="text-align: center;">Ability</p> <p>Willingness</p>	<p style="text-align: center;">Increase</p> <p>Decrease</p>	<p>The large inheritance increases their ability to take risks because it decreases the proportion of expenses to total assets.</p>
<p>Ability</p> <p style="text-align: center;">Willingness</p>	<p style="text-align: center;">Increase</p> <p>Decrease</p>	<p>Their willingness to take risk is increased by Mr. Becker's willingness to invest in riskier assets like private equity and hedge funds.</p>

Reference:

CFA Level III, Volume 2, Study Session 4, Reading 8.

QUESTION 2 HAS FOUR PARTS (A, B, C, D) FOR A TOTAL OF 28 MINUTES.

Iowa State University is a public, tax-exempt institution that receives a portion of its funding needs from an endowment. Each year, the endowment pays out 3.5% of last year's market value to fund the current year's spending needs. The market value of the endowment last year was \$250 million dollars, which means that this year's funding will be approximately 15% of the university's total needs. The university would like to maintain this level of support into the future. As a publicly funded institution the investment committee is wary of certain investments that contradict with the university's policy of a moral and healthy lifestyle.

The inflation rate in the United States, according to the consumer price index, is expected to be 2.5% for the foreseeable future. Educational expenses have been increasing faster than consumer prices, at about 4% per year. Management expenses for the endowment are one half of a percent per year.

The markets have been especially volatile over the last few years and the university investment committee is worried that they may not be able to meet spending needs in the future. Several of the past years have seen dramatic swings in the total assets of the fund and large drawdowns after yearly spending needs. The committee has asked their portfolio advisor to look into the situation and recommend possible actions.

The last five years history for the endowment and spending is shown below. (all dollar amounts are in thousands USD)

Year Ending December	Market Value	3.5% Spending for Next Year
2007	\$200,000	\$7,000
2008	\$275,000	\$9,625
2009	\$325,000	\$11,375
2010	\$215,000	\$7,525
2011	\$250,000	\$8,750

- A. i. Formulate the return objective for the ISU endowment.
 ii. Calculate the required return for the ISU endowment. **Show** your calculations

(6 minutes)

- B.** i. Calculate the spending needs based on the three-year ruling average spending rules. **Show** your calculations.
- ii. Select whether the change in spending rule increases or decreases risk tolerance and support with one reason.

Answer Question 2-B.ii in the Template provided on page 11.

(6 minutes)

- C.** Formulate each of the following constraints for the ISU endowment's investment policy statement (IPS):
- i. Unique circumstances
 - ii. time horizon
 - iii. liquidity

(6 minutes)

The Save-a-Live Foundation is a nonprofit organization focused on providing support for the homeless in and around Minneapolis, Minnesota. The foundation has a very large investment portfolio left to it by a wealthy benefactor and receives much of its annual spending needs through donations. The foundation is tax-exempt as long as it meets minimum requirements for payment of proceeds set by the IRS.

- D.** Choose whether the risk tolerance component of the IPS is higher, lower, or no different for the Save a Life foundation relative to the ISU endowment. Discuss two reasons that support your answer.

Answer Question 2-D in the Template provided on page 12.

(10 minutes)

Template for Question 2-B ii

Select whether the change in spending rule increases or decreases risk tolerance	Support with One reason
Increase Decrease	

Template for Question 2-D

Choose whether the risk tolerance component of the IPS is higher, lower, or no different for the Save a Life foundation relative to the ISU endowment.	Discuss two reasons that support your answer.
Higher Lower No Different	

Solution for Question 2.

A i. Solution:

The University’s objective is to maintain the real value of the endowment to provide perpetual support to the university for about 15% of its annual budget.

A ii. Solution:

The required return for the endowment is:

$$(1.035)(1.04)(1.005) - 1 = 8.18\%$$

Reference:

CFA Level III, Volume 2, Study Session 6, Reading 13.

B i. Solution:

Average of last three years’ market values = $(\$250 + \$215 + \$325)/3 = \$263,333,000$

Spending based on 3.5% = **\$9,216,670**

B ii. Solution:

Template for Question 2-B ii

Select whether the change in spending rule increases or decreases risk tolerance	Support with One reason
<p style="text-align: center;"> <input checked="" type="radio"/> Increase <input type="radio"/> Decrease </p>	<p style="text-align: center;">Using a rolling average spending rule increases risk tolerance because there is less volatility in spending in any given year.</p>

Reference:

CFA Level III, Volume 2, Study Session 6, Reading 13.

C Solution:

i. Unique circumstances

Wary of the perception of some investments, the committee would most likely prohibit investment in ‘vice’ stocks like tobacco, alcohol, and gambling.

ii. Time horizon

The endowment has a single-stage, long-term time horizon supporting the university into perpetuity.

iii. Liquidity

The endowment is required to pay out 3.5% of its prior year market value plus management expenses each year for a total liquidity need of 4.0%.

Reference:

CFA Level III, Volume 2, Study Session 6, Reading 13.

D Solution:

Template for Question 2-D

<p>Choose whether the risk tolerance component of the IPS is higher, lower, or no different for the Save a Life foundation relative to the ISU endowment.</p>	<p>Discuss two reasons that support your answer.</p>
<p style="text-align: center;">Higher</p> <p style="text-align: center;">Lower</p> <p style="text-align: center;">No Different</p>	<p>The foundation has a higher ability to take risk because its needs are met by donations as well as having a sizeable portfolio</p> <p>The foundation has a higher willingness to take risk because it has no contractual obligation to meet specific funding goals.</p>

Reference:

CFA Level III, Volume 2, Study Session 6, Reading 13.

QUESTION 3 HAS TWO PARTS (A, B) FOR A TOTAL OF 10 MINUTES.

Paul Shannon at Emerging Investments LLC is studying a country for part of his frontier market growth portfolio. He is familiar with the country's economic fundamentals but is most concerned with the government's structural policy.

A. List five general elements of a pro-growth government structural policy.

(5 minutes)

Paul consults with one of the other analysts at the firm who has also been studying the country. The analyst has a few updates on economic fundamentals within the country.

Update #1: The government has nationalized various sectors and businesses citing public welfare.

Update #2: The government has increased the amount budgeted to increase the number and quality of public schools.

B. State whether each update is positive for economic growth in the country and which element of structural policy is related.

(5 minutes)

Solution for Question 3.

A Solution:

Five general elements of pro-growth government structural policy are:

- i. Sound fiscal policy
- ii. Competition within the private sector is encouraged
- iii. Sound tax policy
- iv. Minimal intrusion into the private sector by the government
- v. Infrastructure and human capital development are supported by the government

Reference:

CFA Level III, Volume 3, Study Session 7, Reading 15.

B Solution:

Update #1: This is a negative to economic growth. Policy- Minimal intrusion into the private sector by the government.

Update #2: This is positive for economic growth. Policy- Infrastructure and human capital development are supported by the government.

Reference:

CFA Level III, Volume 3, Study Session 7, Reading 15.

QUESTION 4 HAS TWO PARTS (A, B) FOR A TOTAL OF 25 MINUTES.

John Galt Investments has been experiencing some peculiarly volatile results across its portfolios over the last year and its manager, Jim Blake, is anxious to find out why. Mr. Blake speaks to each of his five portfolio managers and finds out that each manager was using a different approach to asset allocation. To further complicate matters, while the managers could describe their approach they did not know what the approach was formally called.

Below is the transcript from each manager's description of their approach:

Mr. Brown: I have developed my approach through years of work as a manager. I generally use a rule-based system that is widely used among professionals.

Ms. Emmet: I have no particular view on expected class returns and my clients have an average risk tolerance. My main goal is to design a well-diversified portfolio.

Mrs. Jenkins: After having tried other approaches, I found one that is not as sensitive to changes in input estimation. By drawing on historical averages of the inputs, I can design a portfolio around a more stable efficient frontier.

Mr. Crowley: My portfolio is designed for institutional investors like banks and insurance companies. These institutions are considered quasi-trust fiduciaries and are required to meet their financial obligations.

Ms. Jones: I have created a computer program that models possible capital market assumptions and applies thousands of possible combinations over the investing horizon. I then select the most appropriate allocation for the best long-term results.

- A.** Given the statements by each manager, decide the most likely asset allocation approach and describe one advantage of the approach. Possible allocation choices are: Resampled Efficient Frontier, Black-Litterman, Monte Carlo Simulation, Asset-Liability Management, and Experienced-Based

Answer Question 4-A in the Template provided on page 19.

(15 minutes)

Mr. Blake is now looking over the portfolios of two of the firm's managers and is trying to find the correct asset class weightings that would combine for one efficient portfolio (each portfolio currently lies on the efficient frontier). Portfolio A has an expected return of 10% and Portfolio B has an expected return of 15%. There are four asset classes with the weightings in each portfolio given below:

Portfolio_A ($w_1 = 0.25$, $w_2 = 0.15$, $w_3 = 0.20$, $w_4 = 0.40$)

Portfolio_B ($w_1 = 0.30$, $w_2 = 0.20$, $w_3 = 0.35$, $w_4 = 0.15$)

- B.** Calculate the asset class-weightings in the combined portfolio for the efficient portfolio with an expected return of 11%. **Show** your calculations.

Template for Question 4-A

Manager	Given the statements by each manager, decide the most likely asset allocation.	Describe one advantage of the approach.
Mr. Brown		
Ms. Emmet		
Mrs. Jenkins		
Mr. Crowley		
Ms. Jones		

Solution for Question 4.**A Solution:****Template for Question 4-A**

Manager	Given the statements by each manager, decide the most likely asset allocation.	Describe one advantage of the approach.
Mr. Brown	Experience - Based Techniques	Easy to understand and implement
Ms. Emmet	Black-Litterman	Provides a stable efficient frontier, Allows portfolio constraints like negative weights
Mrs. Jenkins	Resampled Efficient Frontier	Small changes in inputs produce only minor changes, Portfolios are better diversified than traditional mean-variance
Mr. Crowley	Asset-Liability Management	Considers asset allocation with respect to liabilities to better meet requirements,
Ms. Jones	Monte Carlo Simulation	Generates a distribution of outcomes that is more stable, Incorporates effect of various capital market assumptions

*Reference:**CFA Level III, Volume 3, Study Session 8, Reading 17,***B Solution:**

Expected Return = (weight_A)(Expected return of A)+(weight_B)(Expected return of B)

$$0.11 = W_A (0.10) + (1 - W_A)(0.15)$$

$$W_A = 0.80, W_B = 0.20$$

$$\text{Asset Class 1: } (0.80 \times 0.25) + (0.20 \times 0.30) = 0.26$$

$$\text{Asset Class 2: } (0.80 \times 0.15) + (0.20 \times 0.20) = 0.16$$

$$\text{Asset Class 3: } (0.80 \times 0.20) + (0.20 \times 0.35) = 0.23$$

$$\text{Asset Class 4: } (0.80 \times 0.40) + (0.20 \times 0.15) = 0.35$$

*Reference:**CFA Level III, Volume 3, Study Session 8, Reading 17.*

QUESTION 5 HAS ONE PARTS (A) FOR A TOTAL OF 15 MINUTES.

Robert Jones is a portfolio manager for a large bank which has written a guaranteed liability due in four years. The liability is for \$93.43 million at the end of the period and YTM remains stable at 2.75% over the period. Jones calculates the present value of the liability at approximately \$83.82 million.

Jones currently holds two bonds in a portfolio and would like to add a third to immunize the portfolio for the liability. Below are shown the current portfolio and three possible choices for the immunization.

Bonds in Portfolio			
Bond	Market Price (USD)	Total Market Value (USD)	Total Dollar Duration
Bond A	101.75	\$22,550,000	\$525,500
Bond B	95.6	\$31,250,750	\$2,253,750

Bonds Available to Complete Portfolio			
Bond	Market Price (USD)	Yield to Maturity	Modified Duration
Bond C	99.97	3.25%	1.45
Bond D	99.36	3.50%	1.91
Bond E	99.35	2.50%	1.89

- A. Use the Modified Duration Approach and the Dollar Duration Approach to calculate and choose which bond (C, D, or E) is most suitable to complete the immunized portfolio. **Show** your calculations.

(15 minutes)

Solution for Question 5.

A Solution:

Modified Duration Approach

- The single-payment liability has a present value of \$83,822,194 million and the bonds in the existing portfolio have a present value of (\$22.55 million + \$31,250,750) \$53,800,750. So the dollar duration of the most suitable bond must have a present value of \$30,021,444 and will be about 35.8% of the portfolio
- Modified duration of existing bonds is:
 A: $(525,500/22,550,000)/0.01 = 2.33$
 B: $(2,253,750/31,250,750)/0.01 = 7.21$

We find the modified duration of the most suitable bond by:

weighted average portfolio modified durations $\times 1 = (\text{MD of A})(\% \text{ of A}) + (\text{MD of B})(\% \text{ of B}) + (\text{MD of required Bond X})(\% \text{ of X bond})$

$$4 \times 1 = 2.33 \times 26.9\% + 7.21 \times 37.3\% + X \times 35.8\%$$

$$= (\text{weighted average portfolio modified durations}) - (\text{MD of A})(\% \text{ of A}) - (\text{MD of B})(\% \text{ of B}) / (\% \text{ of X bond})$$

$$X \times 35.8\% = 4.0 - [(2.33 \times 26.9\%) + (7.21 \times 37.3\%)]$$

$$X = 0.6839 / 0.358 = 1.91$$

So, Jones should complete the portfolio by buying \$30,084,246 of bond D

Dollar Duration Approach

- The dollar duration of the liability is $(\text{Present Value} \times \text{duration} \times 0.01) = \$3,352,888$
- The present value of the most suitable bond must be $\$30,021,444 = (\$83,822,194 - \$53,800,750)$ or $(\text{present value liability} - \text{dollar value existing portfolio})$
- The dollar duration of the existing bonds in the portfolio equal $\$2,779,250 = (\$525,500 + \$2,253,750)$
- So, dollar duration of most suitable bond is the one closest to the difference between the DD of the liability and the DD of existing = $(\$3,352,888 - \$2,779,250) = \$573,638$

Dollar Duration of C = $1.45 \times 30,021,444 \times 0.01 = \$435,311$
 Dollar Duration of D = $1.91 \times 30,021,444 \times 0.01 = \$573,401$
 Dollar Duration of E = $1.89 \times 30,021,444 \times 0.01 = \$567,405$

So, Jones should buy \$30,021,444 of bond D

Reference:

CFA Level III, Volume 4, Study Session 10, Reading 20.

QUESTION 6 HAS FOUR PARTS (A, B, C, D) FOR A TOTAL OF 20 MINUTES.

Brian Morris, CFO of Alfo Manufacturing, is evaluating the company’s defined benefit pension plan. The plan is invested with P.S. Salow Capital, a manager in the large-cap growth category for U.S. equity investments. The benchmark for the portfolio is the Russell 1000 Growth Index, a large-cap index of U.S. equities.

Morris selects a returns-based style analysis to measure the performance of the portfolio and chooses four Russell indexes to reflect different investment styles.

- 1) Russell 1000 large-cap value
- 2) Russell 1000 large-cap growth
- 3) Russell 2000 small-cap value
- 4) Russell 2000 small-cap growth

The table below shows the results of a rolling three year monthly Sharpe style weights for the last four years.

Style Index	Rolling Three-year Monthly Sharpe Style Weight			
	2008	2009	2010	2011
Russell 1000 large-cap value	1%	1%	2%	4%
Russell 1000 large-cap growth	98%	96%	93%	89%
Russell 2000 small-cap value	0%	0%	2%	2%
Russell 2000 small-cap growth	1%	3%	3%	5%

Morris calculates the style fit for the four years at 80% and the annualized tracking risk at 8.2 percent. The annualized active return to the portfolio is -0.75 percent.

- A.** Determine whether the portfolio was actively managed for the period shown and support your answer with one reason. No calculations required.

(3 minutes)

- B.** Determine whether the portfolio experienced significant style drift over the period and support your answer with one reason. No calculations required.

(3 minutes)

- C.** Calculate and interpret the information ratio of the portfolio. **Show** your Calculations.

(5 minutes)

Brian then moves to analyze his own personal retirement portfolio, managed by another advisor. Working with his advisor, they agreed that his portfolio should be invested with a value style. Brian has put together a table of the characteristics of his portfolio and those of the market benchmark, as shown below.

	<u>Portfolio</u>	<u>Benchmark</u>
Number of Stocks	30	700
Weighted-average market cap	\$25 billion	\$45 billion
Dividend Yield	3.2%	1.9%
P/E	13	22
P/B	1.15	2.5
EPS Growth (5 year average)	10.0%	13.0%
Sector		
Consumer Discretionary	14.0%	11.0%
Consumer Staples	13.0%	10.0%
Energy	12.0%	13.0%
Finance	17.0%	14.0%
Utilities	16.0%	12.0%
Healthcare	16.0%	20.0%
Information Technology	12.0%	20.0%

- D.** Decide if the advisor has invested the portfolio according to a value or growth style and give two reasons to support your decision.

(9 minutes)

Solution for Question 6.

A Solution:

It does appear that the portfolio was actively managed during the period because the style fit is only 80%, meaning that the returns explained by security selection is 20%.

Reference:

CFA Level III, Volume 4, Study Session 12, Reading 23.

B Solution:

The portfolio experienced significant style drift over the four years. The portfolio gradually drifted to weighting in small-cap growth and large-cap value from its original mandate of large-cap growth.

Reference:

CFA Level III, Volume 4, Study Session 12, Reading 23.

C Solution:

The information ratio is $-0.75\%/8.2\% = -9.15\%$ meaning that for each percentage point of tracking risk, the portfolio lost approximately .09% of active return.

Reference:

CFA Level III, Volume 4, Study Session 12, Reading 23.

D Solution:

The portfolio does appear to be invested according to a value style because:

- The weighted average market capitalization of the investments is less than the benchmark, implying that the companies sell for less than average
- The P/E and P/B ratios within the portfolio are lower than the benchmark
- EPS growth in the portfolio is less than the benchmark
- The portfolio has relatively less invested in growth sectors like IT and Health Care and more in value sectors like Utilities and Finance

Reference:

CFA Level III, Volume 4, Study Session 12, Reading 23.

QUESTION 7 HAS TWO PARTS (A, B) FOR A TOTAL OF 20 MINUTES.

Allright Advisors manages a portfolio of \$200 million, allocated to 75% stocks with a beta of 1.05 and 25% in bonds with a modified duration of 6.0. The portfolio manager would like to change the allocation tactically to 60% in stocks and 40% in bonds while changing the beta of the stock position to 1.0 and the modified duration to 5.0. He will be using a stock index futures contract, priced at \$250,000 with a beta of 0.95, and a bond futures contract, priced at \$125,000 with an implied modified duration of 6.5.

- A.** Determine how many stock index and bond index futures contracts the portfolio manager needs to use and whether to go long or short the contracts.

(10 minutes)

- B.** At the end of the year, the stock portfolio has fallen by 3 percent and the bonds have risen by 1 percent. The stock index futures price is now \$241,250 and the price for the bond futures is now \$126,500. Determine the market value of the portfolio assuming the tactical positioning in part A, and compare it to the market value of the portfolio had the transactions been done in the securities themselves.

(10 minutes)

Solution for Question 7.

A Solution:

To revise the allocation from 75% stock (\$150 million) and 25% bonds (\$50 million) to 60% stocks (\$120 million) and 40% bonds (\$80 million), the portfolio manager must synthetically sell \$30 million of stock and buy \$30 million of bonds.

$$\begin{aligned} \text{Number of stock futures} &= ((0 - 1.05)/.95)(\$30 \text{ million}/\$250,000) \\ &= -132.63 \rightarrow \text{sell 133 stock futures contracts} \end{aligned}$$

$$\begin{aligned} \text{Number bond futures} &= ((6.0 - 0)/6.5)(\$30 \text{ million}/\$125,000) \\ &= 221.54 \rightarrow \text{buy 222 bond futures contracts} \end{aligned}$$

With these positions the manager has effectively sold \$30 million in stock and bought \$30 million in bonds to reallocate the portfolio to 60% stocks and 40% bonds.

Now the portfolio manager needs to adjust the beta and modified durations on the positions as required.

$$\begin{aligned} \text{Number of stock futures} &= ((1.0 - 1.05)/0.95)(\$120 \text{ million}/\$250,000) \\ &= -25.26 \rightarrow \text{sell 25 additional stock futures contracts} \end{aligned}$$

$$\begin{aligned} \text{Number of bond futures} &= ((5.0-6.0)/6.5)(\$80 \text{ million}/\$125,000) \\ &= -98.46 \rightarrow \text{sell 98 bond futures contracts} \end{aligned}$$

The net action that should be taken to reallocate the portfolio and adjust the beta or duration is: Sell 158 stock futures contracts and Buy 124 bond futures contracts

Reference:

CFA Level III, Volume 5, Study Session 15, Reading 26.

B Solution:

At the end of the year, the stock portfolio has fallen by 3 percent and the bonds have risen by 1 percent. The stock index futures price is now \$241,250 and the price for the bond futures is now \$126,500. Determine the market value of the portfolio assuming the tactical positioning in part A, and compare it to the market value of the portfolio had the transactions been done in the securities themselves.

The value of the stock is \$150 million $(1 - 0.03) = \mathbf{\$145.5 \text{ million}}$

The profit on the stock futures = $-158 (\$241,250 - \$250,000) = \mathbf{\$1.3825 \text{ million}}$

The total value of the stock position is = **\$146.8825 million**

The value of the bonds is \$50 million (1.01) = **\$50.5 million**

The profit on the bond futures is = **124 (\$126,500 – \$125,000) = \$186,000**

The total value of the bond position is = **\$50.686 million**

The value of the portfolio is = **\$146.8825 + \$50.686 = \$197.5685 million**

Had the transactions been done in the securities themselves, the stock would be worth \$120 million (1-.03) or **\$116.4 million** and the bonds would be worth \$80 million (1.01) or **\$80.8 million** for a total value of **\$197.2 million** and a difference of **\$368,500**.

Reference:

CFA Level III, Volume 5, Study Session 15, Reading 26.

QUESTION 8 HAS TWO PARTS (A, B) FOR A TOTAL OF 17 MINUTES.

Elena Murphy, trustee for the Murphy Family Trust, is meeting with the family portfolio manager at Broadway Asset Management for their yearly review. The portfolio manager tells Ms. Murphy that the firm's outlook has changed and wants to review and revise the trust's rebalancing strategy.

The current allocation and corridor widths are shown below. Ms. Murphy want to make sure the strategy remains in compliance with the family's long-term objective of providing growth but with stability of principal.

Murphy Family Strategic Asset Allocation and Rebalance Corridor		
Asset Class	Target Weight	Corridor Width
Domestic Equity	25.0%	+/- 3.5%
International Equity	15.0%	+/- 2.5%
Emerging Market Equity	7.5%	+/- 1.5%
Domestic Bonds	25.0%	+/- 3.0%
International Bonds	15.0%	+/- 2.5%
Government Securities	5.0%	+/- 2.0%
Commodities	7.5%	+/- 3.5%

The portfolio manager wants to discuss the firm's revised expectations below and how they may affect the corridor widths within the rebalancing strategy.

- Emerging markets are forecast to outperform in the long-run but may experience increased volatility over the coming year.
 - The firm is revising its cost schedule by increasing fees for management and per transaction
 - Because of global economic crises, correlations between asset classes will probably increase over the next year
- A.** Determine whether the corridor width for the designated asset class should be wider, narrower, or unchanged given each revised expectation. Justify each response with one reason. No calculations are required.

Answer Question 8-A in the Template provided on page 31.

(12 minutes)

Ms. Murphy would also like to evaluate the performance of the rebalancing strategy in equities over the last year. The equity markets have been trending upwards over the last 12 months without much volatility. The equity portfolio has been rebalanced so that the overall portfolio value will not fall to zero, essentially there is a minimum value for the portfolio.

- B.** Select the rebalancing strategy that has been used for the portfolio and whether it has outperformed or underperformed the other two strategies. State one reason why it has outperformed or underperformed.

Answer Question 8-B in the Template provided on page 32.

(5 points)

Template for Question 8-A

<p>Asset class and Revised Expectation</p>	<p>Determine whether the corridor width for the designated asset class should be wider, narrower, or unchanged given each revised expectation. (circle one)</p>	<p>Justify each response with one reason.</p>
<p>Emerging Market Equity: Emerging markets are forecast to outperform in the long-run but may experience increased volatility over the coming year.</p>	<p>Wider Narrower Unchanged</p>	
<p>Commodities: The firm is revising its cost schedule by increasing fees for management and per transaction</p>	<p>Wider Narrower Unchanged</p>	
<p>Domestic Equity: Because of global economic crises, correlations between asset classes will probably increase over the next year</p>	<p>Wider Narrower Unchanged</p>	

Template for Question 8-B

<p>Select the rebalancing strategy that has been used for the portfolio</p>	<p>State whether the strategy has outperformed or underperformed relative to the other two strategies</p>	<p>State one reason for the outperformance or underperformance</p>
<p>Buy-and-Hold</p> <p>Constant Mix</p> <p>CPPI</p>	<p>Outperformed</p> <p>Underperformed</p>	

Solution for Question 8.**A Solution:****Template for Question 8-A**

Asset class and Revised Expectation	Determine whether the corridor width for the designated asset class should be wider, narrower, or unchanged given each revised expectation. (circle one)	Justify each response with one reason.
Emerging Market Equity: Emerging markets are forecast to outperform in the long-run but may experience increased volatility over the coming year.	<p style="text-align: center;">Wider</p> <p style="text-align: center;"><input checked="" type="radio"/> Narrower</p> <p style="text-align: center;">Unchanged</p>	Generally, the greater the volatility of an asset class the narrower the corridor width. This helps to keep proportions within the portfolio from quickly moving outside of assigned ranges
Commodities: The firm is revising its cost schedule by increasing fees for management and per transaction	<p style="text-align: center;"><input checked="" type="radio"/> Wider</p> <p style="text-align: center;">Narrower</p> <p style="text-align: center;">Unchanged</p>	Increased transaction fees mean the asset classes should be rebalanced less frequently to avoid higher costs. Widening the corridors will help to decrease number of rebalancing events.
Domestic Equity: Because of global economic crises, correlations between asset classes will probably increase over the next year	<p style="text-align: center;"><input checked="" type="radio"/> Wider</p> <p style="text-align: center;">Narrower</p> <p style="text-align: center;">Unchanged</p>	As correlations increase, assets tend to move together and further divergence from target is less likely. This means less frequent rebalancing and wider corridor widths for all assets.

*Reference:**CFA Level III, Volume 6, Study Session 16, Reading 30.*

B Solution:**Template for Question 8-B**

Select the rebalancing strategy that has been used for the portfolio	State whether the strategy has outperformed or underperformed relative to the other two strategies	State one reason for the outperformance or underperformance
Buy-and-Hold Constant Mix CPPI	Outperformed Underperformed	The constant-proportion portfolio insurance strategy will outperform the other two strategies in a trending market. This is because the CPPI buys more of an asset as it increases or sells the asset as it decreases.

Reference:

CFA Level III, Volume 6, Study Session 16, Reading 30.

QUESTION 9 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 9 MINUTES

Strategic Associates (SA) is a U.S. based asset management firm. SA is running two funds- VentureCap, a venture capital fund structured as a limited partnership providing funds to start-ups, and a global equity fund. VentureCap is being managed by Nelson Gatch, a SA employee. The timing of capital calls and distribution of earnings is based on Gatch's judgment. The table below shows the cash flows earned by the fund as well as beginning and ending fund market values for the most recent month. Gatch would like to assess how the fund performed over the evaluation period.

Table: VentureCap's Cash Flows and Beginning and Ending Market Value

	\$'000
Beginning market value – Day 1	1,500
Contribution – Day 7	45
Contribution – Day 20	30
Ending market value – Day 30	1,630

- A. Identify the *most* suitable method for calculating VentureCap's fund return over the evaluation period and calculate the return accordingly. **Show** your calculations.

(3 minutes)

- B. Gatch suspects that his performance evaluation of VentureCap may be subject to data quality issues. Determine whether his suspicions are justified and if yes, identify one potential data quality issue.

Answer Question 9-B in the Template provided on page 37.

(2 minutes)

The global equity fund is divided into two regions, North America and Europe. Each segment is managed by two junior portfolio managers. SA's chief appraiser is comparing the performances of the two individuals, managing the North American region. He has collected risk-adjusted performance appraisal measures for the two managers.

Table: Risk-adjusted Performance Appraisal Measures

	North American Manager I	North American Manager II
Treynor Measure	0.8	1.1
Sharpe ratio	4.2	3.0

- C.
- i) Comment on the differences between the performances of the two managers paying particular attention to risk and assume reported rates of return are similar (no calculations are required).
 - ii) Identify two criticisms of the appraisal measures used.

(4 minutes)

Template for Question 9-B

Are Gatch's suspicions justified?	If yes, identify one potential data quality issue.
Yes	
No	N/A

Solution for Question 9.

A Solution:

The most suitable method for calculating VentureCap's fund return is the money-weighted rate of return. This is because Gatch retains discretion over the timing of cash flows into and out of the fund.

Money-weighted rate of return calculation:

CF0: 1,500,000

C01: 0

F01: 6*

C02: 45,000

F02: 1

C03: 0

F03: 12**

C04: 30,000

F04: 1

C05: 0

F05: 9***

C06: - 1,630,000

CPT IRR: 0.116723%

Monthly IRR: $(1 + 0.00116723)^{30} - 1 = 3.56\%$

*Period between beginning of the month and first contribution = $7 - 1 = 6$ days

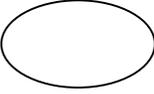
**Period between first and second contribution = $20 - 8 = 12$ days

***Period between end of month and second contribution = $30 - 21 = 9$ days

Reference:

CFA Level III, Volume 6, Study Session 17, Reading 31.

B Solution:**Template for Question 9-B**

Are Gatch's suspicions justified?	If yes, identify one potential data quality issue.
	<p>Potential issues include:</p> <ul style="list-style-type: none"> • Venture capital funds are illiquid and thus infrequently priced which complicates estimation of reported rates of returns. • The underlying valuations may be suspect thereby invalidating reported returns. • Due to inaccuracy inherent in the estimation techniques, an investor may not be able to enter or leave the venture capital fund close to the reported valuations.
No	

Reference:

CFA Level III, Volume 6, Study Session 17, Reading 31.

C Solution :

- i. Manager I has a higher level of systematic risk exposure relative to Manager II. This is because Manager I reports a lower Treynor measure. The denominator of the Treynor measure comprises of beta, a measure of systematic risk. The higher the systematic risk (and beta), the lower the Treynor measure. Due to a higher Sharpe ratio, Manager I has taken on a lower level of total risk relative to Manager II. With a higher level of total risk and a lower level of systematic risk, Manager II is undertaking a higher level of nonsystematic risk.

ii. Possible answers include:

- Appropriateness of the assumptions underlying the CAPM model is questionable.
- The reliance of the Treynor model on CAPM has come under attack due to the single-index nature of the model.
- Using a proxy for the true market portfolio will mean that slight changes in the proxy can distort performance appraisal results.
- Using a market index or custom benchmark makes it difficult for the manager to precisely replicate the benchmark's return over a period of time.
- Stability of the parameters is an issue.
- There may be estimation error involved in estimating the parameters underlying risk-adjusted performance appraisal measures.

Reference:

CFA Level III, Volume 6, Study Session 17, Reading 31.