

FinQuiz.com

CFA Level III Mock Exam 3
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Revision 1

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FinQuiz.com – 3rd Mock Exam 2018 (AM Session)

The morning session of the 2018 Level III CFA Examination has 10 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	34
2	Portfolio Management – Institutional Investors	26
3	Portfolio Management – Economics	15
4	Portfolio Management – Asset Allocation	18
5	Portfolio Management – Fixed-Income Investments	9
6	Portfolio Management – Equity Investments	18
7	Portfolio Management – Alternative Investments	9
8	Portfolio Management – Risk Management	21
9	Portfolio Management – Execution, Monitoring and Rebalancing	21
10	Portfolio Management – Performance Evaluation	9
Total:		180

QUESTION 1 HAS FOUR PARTS (A, B, C, D) FOR A TOTAL OF 34 MINUTES.

Forrest Wiltkinson is a professional player for the New Horizon cricket club who, along with a sizeable salary from his career, has also done well with his many venture capital investments. Mr. Wiltkinson grew up in a poor family and still lives well within his means despite his sizeable wealth.

Forrest will play one more year and then plans on devoting the rest of his life to charitable causes. At the end of the year he will sell his primary residence for an estimated \$500,000 (after taxes) so he can travel more freely. His philanthropic pursuits and life as a professional athlete has taken him around the globe and he is disheartened by the working conditions prevalent in some regions. Going forward, he makes a commitment not to invest in tobacco or gambling companies or those with human rights violations.

He is 34 years old now and has an investment portfolio of \$40 million. His annual salary is \$5 million and pays taxes of 40% on all income and 15% on capital gains. For planning purposes, his portfolio manager tells him that he can expect a 7.5% after-tax nominal return in his investments over the next year.

Living expenses amount to about \$750,000 per year and rise with the general rate of inflation around 2.5% per year.

- A.**
- i. Formulate the return objective for Forrest's investment policy statement.
 - ii. Calculate the after-tax nominal rate of return that is required during his first year of retirement. **Show** your Calculations.

(12 minutes)

- B.**
- i. Identify two factors from Forrest's profile that increases his ability to take risks.
 - ii. Identify two factors from Forrest's profile that increases his willingness to take risks.
 - iii. Describe Forrest's overall risk tolerance

(8 minutes)

- C. Formulate each of the following constraints in Forrest’s investment policy statement and support with one reason from the profile.
- i. Liquidity requirement
 - ii. Time horizon
 - iii. Unique circumstances

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

(6 minutes)

Ten years have passed and instead of retiring to charitable causes, Mr. Wilkinson has become a successful private equity fund manager. He has grown accustomed to the flashy and expensive lifestyle and wants to be able to maintain it into his eventual retirement. Though his investable assets have increased, his expenses have also increased and the required return on his portfolio to meet retirement goals has increased to 7 percent.

- D. i. Identify three factors that affect Forrest’s risk tolerance and identify whether ability or willingness to tolerate risk is increased or decreased.

(8 minutes)

Template for Question 1-C

Constraint	Formulate each of the following constraints in Forrest’s investment policy statement and support with one reason from the profile.
i. Liquidity	
ii. Time Horizon	
iii. Unique Circumstances	

QUESTION 2 HAS TWO PARTS (A, B) FOR A TOTAL OF 26 MINUTES.

Riva Manufacturing makes park benches and road signs for markets in North America. The company did well over the last few years, benefiting from significant government stimulus dollars into road and infrastructure projects. Recently however, the company has returned to operating losses, a trend that was developing before stimulus measures.

The company has offered a defined benefit plan for employees and calculates benefits by number of years service and compensation at time of retirement. Benefits for the plan are not indexed to inflation and the pension fund is currently operating with a surplus.

The board has recently decided to shift employee retirement options to a defined contribution plan and has closed the defined benefit plan to new members. Because of this, the plan will experience an increase in the proportion of inactive members relative to active members. The board is worried about the future burden the plan may place on the company and would like to achieve an excess return over the discount rate to minimize contributions while still maintaining the plan surplus. The total return objective for 2012 is the same as last year but the nominal discount rate for calculating PBO has been reduced to 6.5%.

Other data for the plan is shown in the table below.

Riva Manufacturing Defined Benefit Plan 2011	
Projected Benefit Obligation (PBO)	\$37,458
Pension Assets	\$97,458
Plan Surplus or Deficit	\$60,000
Payments and Distributions	\$850
Average Duration of Liabilities	10 years
Discount Rate	7.5%
Excess Return Target	1.5%

Figures in millions of dollars

- A.** State the return objective for the pension and calculate the excess return target for 2012. **Show** your calculations.

(6 minutes)

- B.** Identify five factors that affect the plan’s ability to take risk. Determine whether each factor increases or decreases the plan’s ability to take risk and support your response with one reason.

Answer Question 2-B in the Template provided on page 8.

(20 minutes)

Template for Question 2-B

<p>Identify Five Factors that affect the plan's ability to take risk.</p>	<p>Determine whether each factor increases or decreases the plan's ability to take risk.</p>	<p>Support your response with one reason.</p>
	<p>increases</p> <p>decreases</p>	

QUESTION 3 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 15 MINUTES.

Growth in China has recently slowed considerably and the analysts at TIP Investments are revising their future growth and valuation analysis. The government has set a target of 7.5% GDP growth over the next year but is known for beating growth targets. Total factor productivity has increased over the last few years with increased capital investment and is now around 3.0%. This has followed growth in the country's capital stock, currently growing around 6.25% per year. The labor force is projected to grow from approximately 1.25 billion people last year to 1.28 billion this year. The output elasticity of labor was recently measured at 0.45.

- A. Calculate the projected GDP growth rate for China given growth in economic fundamentals. **Show** your calculations.

(3 minutes)

Forecasted earnings per share for the Chinese market over the next year are RMB 15.50 with a current annual dividend of RMB 8.50. The market is projected to experience supernormal growth rates found in the previous question but GDP growth will gradually decline over the next 30 years to a terminal sustainable growth rate of 4.25% into perpetuity. A 7.5% inflation-adjusted equity discount rate is appropriate for the market.

- B. Calculate the composite index price for the Chinese market. **Show** your calculations.

(6 minutes)

The S&P500, a broad measure of stocks in the United States, is priced around 1,405 compared to the S&P China BMI Index with an estimated value found in the previous question. Forecasted earnings per share for the companies in the S&P 500 are \$106.50 over the next year.

- C. Calculate the P/E ratio for the U.S and Chinese markets and choose which market is cheaper on a relative value basis.

(6 minutes)

QUESTION 4 HAS TWO PARTS (A & B) FOR A TOTAL OF 18 MARKS

The Wildlife Research and Development Foundation (WRDF) is an institution that funds research in the tropical rainforest climate zones. It not only attempts to discover new species of animals and insects but also aims to preserve their habitat and natural surroundings. For this, it spends a considerable amount for the salvation and protection of species in danger of becoming extinct. Ramon Patrick and Susan Adams are part of the founding team of WRDF. Adams is responsible for the financial aspects of the institution, including the estimation of annual distribution needs and capital sufficiency. Adams has hired Brenda Lasseter to manage WRDF's investment portfolio. Lasseter has established the following:

- An annual distribution rate of 6% needs to be maintained after covering for inflation. The investment management expenses are estimated to be 250bps.
- The risk-free rate is 3.5% and inflation is 4.4%.
- WRDF can borrow at the risk-free rate and intends to hold only non-negative weights of each holding.
- The market risk premium is 5.0%.

Lasseter uses the mean-variance optimization approach to determine the asset allocation that would meet the return objective. The optimization yields 6 corner portfolios. Exhibit 1 displays the characteristics of those portfolios.

Exhibit 1: Corner Portfolios in MVO

Portfolios	Expected Returns(%)	Standard Deviation(%)
1	17.88	29.00
2	16.50	27.50
3	15.75	25.55
4	14.50	22.00
5	13.50	21.30
6	11.25	20.50

Lasseter selects the most suitable combination that has asset class weights has given in Exhibit 2.

Exhibit 2: Composition of Strategic Portfolio

Asset Class	Weight	Beta
US bonds	45%	0.45
Global ex US bonds	25%	0.33
Global REITS	5%	1.79
Emerging market equities	10%	1.88
US equities	15%	1.10

Adams instructs Lasseter to make sure that the portfolio's asset allocation ensures that the institution's risk is allocated efficiently. Accordingly, Lasseter creates a risk budget and determines which positions are optimal.

A. **Determine** the *most* appropriate strategic asset allocation for WRDF, given its objectives and constraints. **Justify** your response.

(5 minutes)

B. (i). **Calculate** the partial derivatives of risk for each asset class. **Show** your calculations.

(5 minutes)

(ii). Assuming the sum of the absolute contribution to total risk for all asset classes equals the portfolio's volatility, **determine** whether the asset allocation selected by Lasseter is optimal from a risk-budgeting perspective. **Justify** your response.

(8 minutes)

QUESTION 5 HAS ONE PART (A) FOR A TOTAL OF 9 MARKS

Karen Anne Gray has been managing the ‘Quart Fixed-Income Fund’ for her investment firm for the past two years. The fund is fully invested in four major sectors of the US fixed-income market and has followed a relatively passive investment strategy during its recent past. Owing to current economic developments in the country, Gray expects a bull market in bonds over the next phase of the business cycle. Since the fund is fully invested and Gray does not want to alter the fund’s basic composition, she plans to use derivatives to increase the fund’s duration. Presently, the fund has a market value of \$15 million with a duration of 7. Gray wishes to increase the duration by 1.5 points. To do so, she has accumulated the following data:

- Price value of basis point of a 10-year Treasury note futures contract is \$77.
- Bonds that can be purchased and financed have a duration of 4.
- A 20-year swap has an effective PVBP of 0.143 for the fixed side and 0.0030 for the floating side.

Gray is attempting to construct an appropriate strategy to achieve the desired duration. However, she is also concerned with the risks inherent in each of the viable options present.

- A. **State** and **describe** three strategies that can alter the portfolio’s duration to the desired level. **Show** your calculations for each strategy. **Mention** one risk for each of the stated strategies.

(9 minutes)

QUESTION 6 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 18 MINUTES.

Rudolf Dithers is the Director for the H. James University endowment and is interested in market efficiencies and biases. He first examines the various weighting schemes employed in index creation, specifically indexes that are price-weighted, value-weighted, and equal-weighted.

The endowment has historically favored mutual funds as a way to gain broad exposure at a low cost. With the increasing popularity of exchange traded funds, Dithers would like to identify any advantages or disadvantages for a report to the investment committee.

- A.** Identify one bias within each of the three index weighting schemes studied.

(6 minutes)

- A.** Identify two advantages and one disadvantage of exchange traded funds over mutual funds.

(6 minutes)

Mr. Dithers is now studying the performance of two managers with allocations from the endowment. Fred Wilma, manager of the Siri Fund, covers 400 stocks and has been able to achieve an information coefficient of 0.05. Jan Barnle, manager of the Pirius Fund, has attained an information coefficient of 0.07 while covering only 150 stocks.

- B.** Calculate the information ratio for each manager. **Show** your calculations.

(6 minutes)

QUESTION 7 HAS TWO PARTS (A, B) FOR A TOTAL OF 9 MINUTES.

A U.S. based portfolio management firm maintains a global equity fund. This year Raul Gibbons, the fund's manager, is considering the addition of South Korean equities to the fund. The purchase will be undertaken in three month's time and the firm has hedged its exposure to the USD/KRW using at-the-money (ATM) options.

After undertaking the hedge, Gibbons believes there is further potential to reduce hedging costs. He would like to select a strategy which maximizes upside potential while maintaining downside protection. Gibbons proposes four alternative strategies for achieving his return enhancement/ cost reduction motive.

Proposal 1: Short position in 25-delta put options

Proposal 2: Long position in a 25-delta risk reversal

Proposal 3: Short position in ATM call options

Proposal 4: Digital options

A. Identify the existing ATM option position held by the firm. Explain your choice.

(3 minutes)

B. Identify the proposal most suitable for achieving the Gibbons' objectives. For each proposal not selected, discuss one reason why it is inappropriate.

(6 minutes)

Answer Question 7-B in the Template provided on page 16.

Template for Question 7-B

<p>Identify the most suitable proposal for achieving Gibbons’ objectives.</p>	<p>For each proposal not selected, discuss one reason why it is inappropriate.</p>
<p>Proposal 1</p>	
<p>Proposal 2</p>	
<p>Proposal 3</p>	
<p>Proposal 4</p>	

QUESTION 8 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 21 MINUTES.

As part of a foreign exchange hedging strategy, a U.S portfolio manager enters into a 6-month forward contract to deliver CAD1,000,000 for dollars. The current 6-month forward rate is \$1.8095/CAD. Three months into the contract, the spot rate is \$1.8038/CAD, the U.S. interest rate is 5.5%, and the foreign rate is 5.0%.

- A.** Calculate the value and direction of any credit risk

(6 minutes)

The manager also holds a portfolio of two stocks, Omnicrom and Fissure Semi. The expected returns for the two stocks are 9% for Omnicrom and 13% for Fissure Semi and their standard deviations are 18% and 21%, respectively. The correlation of returns between the two assets is 0.5

- B.** Calculate the 5% (analytical) value at risk of a \$100,000 portfolio invested 75% in Omnicrom and 25% in Fissure Semi. **Show** your calculations.

(9 minutes)

- C.** List one advantage and two disadvantages of analytical VAR for estimating risk.

(6 minutes)

QUESTION 9 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 21 MINUTES.

Iowa Pork Processors (IPP) closes Wednesday at \$20 per share, a 52-week low but on low volume. Mark Epps, a portfolio manager, thinks the shares could see a rebound over the next few days and decides to place a limit order for 1,000 shares at \$19.95. The shares do not fall to \$19.95 during the day, so the order expires unfilled. The stock closes at \$20.05 that day.

On Friday, Epps revises the order to a limit at \$20.06. The order is partially filled that day and 800 shares are bought at \$20.06. The commission for the order is \$18 and the stock closes at \$20.09 with the remaining order of 200 shares cancelled.

- A.** Calculate the gain or loss on the both the paper and real portfolio. **Show** your calculations.

(3 minutes)

- B.** Calculate the four components of implementation costs: explicit costs, realized profit/loss, delay costs, missed trade opportunity costs. **Show** your calculations.

(12 minutes)

- C.** Calculate the total implementation costs. **Show** your calculations.

(6 minutes)

QUESTION 10 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 9 MINUTES.

Shown below is the attribution analysis for a portfolio manager at the Wellgarden Funds

Sector	Portfolio Weight (%)	Sector Benchmark Weight (%)	Portfolio Return (%)	Sector Benchmark Return (%)
Consumer Staples	8.38	7.72	3.55	3.32
Financials	15.48	13.42	1.66	1.1
Utilities	17.89	22.01	3.21	3.18

Overall Benchmark Return = 2.32%

- A. Calculate the within-sector return for the financials sector. **Show** your calculations.

(3 points)

- B. Calculate the pure-sector allocation return for the consumer staples sector. **Show** your calculations.

(3 points)

- C. Calculate the allocation/selection interaction return for the utilities sector. **Show** your calculations.

(3 points)