

Level III

The Morning Session of the 2007 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.

| Question | Topic | Minutes |
|---------------|---|------------|
| 1 | Portfolio Management – Individual | 33 |
| 2 | Portfolio Management – Individual | 20 |
| 3 | Portfolio Management – Institutional/Behavioral | 12 |
| 4 | Portfolio Management – Individual | 14 |
| 5 | Portfolio Management – Institutional | 23 |
| 6 | Portfolio Management – Institutional | 23 |
| 7 | Portfolio Management – Institutional | 13 |
| 8 | Portfolio Management – Institutional/Equity | 14 |
| 9 | Portfolio Management – Performance Evaluation | 9 |
| 10 | Portfolio Management – Economic Analysis | 19 |
| Total: | | 180 |

Level III

Questions 1 and 2 relate to Jack and Ruth Ingram. A total of 53 minutes is allocated to these questions. Candidates should answer these questions in the order presented.

QUESTION 1 HAS FOUR PARTS (A, B, C, D) FOR A TOTAL OF 33 MINUTES.

Jack and Ruth Ingram, each 50 years old, live in Canada and have recently retired. Jack worked for much of his career at Pitt Manufacturing, a publicly traded, small-capitalization (small-cap) Canadian firm. Jack has agreed to join Pitt's board of directors without compensation. The Ingrams are in good health and have adequate medical insurance coverage.

Jack has accumulated Pitt common stock currently valued at C\$1,000,000 through the company's employee stock ownership program. Since the Pitt stock has appreciated significantly in recent years, Jack's holdings have a low average cost basis. Pitt stock and options on the Pitt stock are traded in active and liquid markets on a national exchange.

The Ingrams have recently inherited C\$2,400,000 net of taxes consisting mostly of small-cap Canadian equities. The inheritance, the Pitt stock Jack has accumulated, and C\$800,000 in bonds and cash equivalents represent their total financial assets. The Ingrams live in a house with a market value of C\$1,250,000. They have decided to donate the house to a provincial park upon their death.

Their only child, Paul (22 years old), has a well-paying job and is economically independent.

The Ingrams are meeting with Caleb Swann, CFA, their long-time advisor, to discuss financial planning issues. The Ingrams agree that their current annual pre-tax income need is C\$200,000. The Ingrams expect that their inflation-adjusted expenses will remain constant during retirement. They plan to fund their living expenses by taking annual distributions from their portfolio with the first distribution to occur immediately. Swann believes an appropriate long-term inflation rate is 2.5 percent and an appropriate planning horizon is 35 years.

Upon their death, the Ingrams wish to leave gifts to Paul and to a local charity. They wish to maintain the purchasing power of these gifts to be equivalent to C\$2,000,000 and C\$1,000,000, respectively, in today's dollars.

In order to better understand his clients, Swann has found it useful to classify each of them as one of four investor personality types:

- Cautious
- Methodical
- Spontaneous
- Individualist

Swann believes he has gathered enough information about the Ingrams to determine their personality types. A summary of this information is presented in Exhibit 1.

Exhibit 1
Personality Information Gathered on Jack and Ruth Ingram

- Jack often reads about investing and realizes that achieving higher returns is accompanied by taking higher risk.
- Jack and Ruth both agree they will accept a lower return if it means they can take less risk.
- Jack likes to be presented with facts rather than generalities, and he is always interested in discussing articles about investing.
- When Ruth was a child, her parents experienced significant financial difficulty as a result of poor performance of their equity investments.
- Ruth is concerned whenever the Ingrams' portfolio experiences moderate fluctuations in value.

In assessing the Ingrams' willingness to take risk, Swann concludes that a shortfall risk (defined as the expected return minus two standard deviations) of –12 percent in any one year would be the most the Ingrams could tolerate.

- A. **Prepare** the nominal pre-tax return objectives of an investment policy statement (IPS) for the Ingrams. **Show** your calculations.

(12 minutes)

- B. **Characterize** the Ingrams as below-average, average, or above-average in their ability to take risk. **Justify** your response with *three* reasons based on the Ingrams' specific circumstances.

Answer Question 1-B in the Template provided on page 7.

(7 minutes)

- C. **Select** the investor personality type for:

- i. Jack
- ii. Ruth

Justify *each* selection with *one* fact from the information about the Ingrams presented in Exhibit 1.

Answer Question 1-C in the Template provided on page 8.

(4 minutes)

- D. **Prepare** the constraints section of an IPS for the Ingrams.

Answer Question 1-D in the Template provided on page 9.

(10 minutes)

Answer Question 1 on This Page

Template for Question 1-B

| | |
|--|---|
| <p>Characterize the Ingrams as below-average, average, or above-average in their ability to take risk. (circle one)</p> | <p>Justify your response with <i>three</i> reasons based on the Ingrams' specific circumstances.</p> |
| <p>Below-average</p> | <p>1.</p> |
| <p>Average</p> | <p>2.</p> |
| <p>Above-average</p> | <p>3.</p> |

Answer Question 1 on This Page

Template for Question 1-C

| Select the investor personality type for i. Jack and ii. Ruth. (circle one for each) | | Justify <i>each</i> selection with <i>one</i> fact from the information about the Ingrams presented in Exhibit 1. |
|---|--|---|
| i. Jack | Cautious Methodical Spontaneous Individualist | |
| ii. Ruth | Cautious Methodical Spontaneous Individualist | |

Answer Question 1 on This Page

Template for Question 1-D

Prepare the constraints section of an IPS for the Ingrams.

| |
|---|
| Prepare the constraints section of an IPS for the Ingrams. |
| |
| |
| |
| |
| |

Level III

QUESTION 2 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 20 MINUTES.

After developing the investment policy statement (IPS) for Jack and Ruth Ingram, Caleb Swann, CFA, reviews their current portfolio, shown in Exhibit 1.

Exhibit 1
Ingrams' Current Portfolio (%)

| Asset Class | Current Allocation | Expected Annual Total Return | Expected Annual Standard Deviation |
|--------------------------|--------------------|------------------------------|------------------------------------|
| Cash equivalents | 13.0 | 3.1 | 3.2 |
| Canadian bonds: | | | |
| Corporate | 4.0 | 4.5 | 6.0 |
| Government | 9.0 | 4.0 | 4.5 |
| Canadian equities: | | | |
| Large-capitalization | 8.0 | 8.0 | 12.5 |
| Small-capitalization | 41.0 | 9.5 | 17.2 |
| Pitt Manufacturing stock | 25.0 | 6.5 | 34.1 |
| Total portfolio | 100.0 | 7.1 | 12.1 |

Swann recognizes that the concentration in the small-capitalization Pitt Manufacturing stock is too high. The Ingrams have given Swann three specific instructions related to their holding of Pitt stock:

- Defer the realization of capital gains and the associated capital gains taxes.
- Significantly reduce the downside risk associated with their holding of Pitt stock, but preserve some upside potential.
- Do not use leverage in the portfolio.

Swann notes that Pitt stock, exchange funds, and put and call options on Pitt stock all have liquid markets. Swann reviews the following four strategies for achieving the goals of the Ingrams:

- Outright sale
- Equity collar
- Exchange fund
- Completion portfolio

A. **Determine** which of the four strategies is the *most* appropriate given the Ingrams' instructions. **Justify** your response with *two* reasons.

Answer Question 2-A in the Template provided on page 15.

(5 minutes)

- B. **State**, for *each* of the strategies not selected in Part A, *one* reason why it is *not* the most appropriate for the Ingrams.

Note: Justifying your answer by simply reversing your response to Part A will receive no credit.

Answer Question 2-B in the Template provided on page 16.

(6 minutes)

In addition to the high concentration in Pitt, Swann recognizes several other problems in the Ingrams' current asset allocation.

- C. **Identify**, based on the Ingrams' IPS, *three* other problems in the current asset allocation. **Support** *each* of your responses with *one* reason.

Answer Question 2-C in the Template provided on page 17.

(9 minutes)

Answer Question 2 on This Page

Template for Question 2-A

| | |
|--|---|
| Determine which of the four strategies is the <i>most</i> appropriate given the Ingrams' instructions. (circle one) | Justify your response with <i>two</i> reasons. |
| Outright sale | 1. |
| Equity collar | |
| Exchange fund | 2. |
| Completion portfolio | |

Answer Question 2 on This Page

Template for Question 2-B

| Strategies not selected in Part A | State, for <i>each</i> of the strategies not selected in Part A, <i>one</i> reason why it is <i>not</i> the most appropriate for the Ingrams. Note: Justifying your answer by simply reversing your response to Part A will receive no credit. |
|--|---|
| 1. | |
| 2. | |
| 3. | |

Answer Question 2 on This Page

Template for Question 2-C

| Identify, based on the Ingrams' IPS, <i>three</i> other problems in the current asset allocation. | Support <i>each</i> of your responses with <i>one</i> reason. |
|---|---|
| 1. | |
| 2. | |
| 3. | |

QUESTION 3 HAS ONE PART FOR A TOTAL OF 12 MINUTES.

John Nultione was recently hired as a portfolio manager with Equity Advisors (EA). As part of his responsibilities, Nultione prepares market forecasts for the firm's chief investment officer, Walt Hyatt. The U.S. equity market declined by 20 percent last year. After constructing a model of factors affecting the market, Nultione becomes convinced that U.S. market returns will be 13.47 percent for the first half of this year followed by an 11.21 percent return for the second half of this year.

Nultione remembers similar conditions several years ago when his forecast was too pessimistic and he missed a significant buying opportunity. He does not want to miss another market low. Nultione proposes a large increase in EA's portfolio allocation to U.S. equities, which will move his position from underweight to overweight. By contrast, Hyatt believes the recent downward trend in the market will continue, and any gains from restructuring EA's portfolio allocation would not be worth the risk of relative underperformance.

After preparing his forecast, Nultione reads reports by several respected analysts, including Harinder Singh. Nultione disagrees with Singh's forecast of a continued decline in the market. Hyatt, however, attended a conference where Singh presented his market forecast. Hyatt found Singh's analysis convincing and agreed with his forecast. Nultione points out that since the conference, several key variables in Singh's analysis have changed. Despite this evidence, Hyatt remains convinced that Singh's forecast is correct.

Hyatt believes that Nultione's proposed portfolio allocation could result in a significant underperformance of EA's portfolio compared to its peers. Hyatt believes such underperformance could harm his own position at the firm. As a result, Hyatt asks Nultione to review the work of the top 20 equity analysts and reassess his forecast. Nultione presents his review of the 20 analysts to Hyatt, focusing on the views of three analysts who agree with Nultione's optimistic market view.

For *each* Nultione and Hyatt:

- i. **Identify** *two* psychological traps they have fallen into.
- ii. **Justify** your position by stating evidence from the information provided.

Note: Four different psychological traps must be identified.

Answer Question 3 in the Template provided on page 23.

(12 minutes)

Answer Question 3 on This Page

Template for Question 3

| For <i>each</i> Nultione and Hyatt: | | |
|---|----|--|
| i. Identify <i>two</i> psychological traps they have fallen into. Note: Four different psychological traps must be identified. | | ii. Justify your position by stating evidence from the information provided. |
| Nultione | 1. | |
| | 2. | |
| Hyatt | 1. | |
| | 2. | |

Level III

QUESTION 4 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 14 MINUTES.

Stephen Maddrey, CFA, has been hired to develop an investment policy statement and strategic asset allocation for the \$3.25 million portfolio of Alan Thornhill. Prior to their first meeting, Thornhill sends Maddrey the e-mail shown in Exhibit 1.

Exhibit 1 Thornhill's E-mail

To: Stephen Maddrey, CFA
From: Alan Thornhill

I am excited to be working with you. I would like you to invest my funds in asset classes chosen from the following comprehensive list of permissible asset classes:

- Money market instruments
- U.S. balanced fund
- Nominal U.S. corporate bonds
- Nominal U.S. government bonds
- S&P 500 Index fund

I do not want to use short-selling in my portfolio.

Thank you.

Maddrey believes Thornhill has made several fundamental errors in specifying the asset classes for his portfolio. In addition, Maddrey recommends inflation-protected bonds be considered because they constitute a separate asset class distinct from nominal bonds. In support of his statement, Maddrey prepares Exhibit 2.

Exhibit 2 Expected Correlation of Returns for Selected Asset Classes

| Asset Class | Nominal U.S. Corporate Bonds | Nominal U.S. Government Bonds | Inflation- protected Bonds |
|-------------------------------|------------------------------------|-------------------------------------|----------------------------------|
| Nominal U.S. corporate bonds | 1.00 | --- | --- |
| Nominal U.S. government bonds | 0.85 | 1.00 | --- |
| Inflation-protected bonds | 0.71 | 0.80 | 1.00 |

A. **Support** Maddrey's recommendation with *two* reasons.

(4 minutes)

B. **Describe** *two* fundamental errors in Thornhill's specification of asset classes for his portfolio.

(4 minutes)

Maddrey is developing a strategic asset allocation for Thornhill. Maddrey has experience conducting mean-variance optimization using unadjusted historical mean returns, variances, and covariances. He is considering integrating the Black-Litterman approach into the asset allocation process.

- C. **Describe** how integrating the Black-Litterman approach into the asset allocation process would affect the:
- i. specification of expected return inputs.
 - ii. level of market diversification of the resulting portfolio.

(6 minutes)

QUESTION 5 HAS FIVE PARTS (A, B, C, D, E) FOR A TOTAL OF 23 MINUTES.

Covell University (CU) is a private, tax-exempt, educational institution in the U.S. CU has an endowment with the purpose of providing financial support to the university budget. Currently, the spending rule for the endowment is 4 percent of the market value of its investment portfolio as of the previous year-end. Based on the endowment's 2006 year-end market value of \$500 million, the annual distribution represents 5 percent of the operating budget for CU, just meeting CU's desired level of endowment support. CU expects a similar dollar level of endowment support, indexed to inflation in its costs, in future years.

The university's operating expenses are expected to grow at a nominal rate of 3.25 percent per year for the foreseeable future. The inflation rate in the U.S., as measured by the Consumer Price Index (CPI), is expected to be 2.5 percent per year for the foreseeable future.

The endowment investment committee is concerned because the endowment has not met its stated return requirement over the last four years. The investment committee has hired Jerome Palmer, CFA, as an investment consultant. Palmer prepares Exhibits 1 and 2 in his review of the endowment and suggests the committee formulate an investment policy statement (IPS).

Exhibit 1
Spending History of CU Endowment

| Year Ending 31 December | Market Value of Endowment | 4% Spending Allowance for the Following Year |
|------------------------------------|--------------------------------------|---|
| 2002 | \$490,000,000 | \$19,600,000 |
| 2003 | \$530,000,000 | \$21,200,000 |
| 2004 | \$495,000,000 | \$19,800,000 |
| 2005 | \$550,000,000 | \$22,000,000 |
| 2006 | \$500,000,000 | \$20,000,000 |

Exhibit 2
Comparison of CU Endowment and the Average University Endowment

| Portfolio Characteristics as of 31 December 2006 | CU Endowment | Average University Endowment |
|---|-------------------------|---|
| Market value of endowment | \$500,000,000 | \$425,000,000 |
| 5-year annualized rate of return | 7.08% | 8.75% |
| Investment management expense | 0.65% | 0.68% |

- A. **Formulate** the return requirement for CU endowment's IPS. **Show** your calculations.

(4 minutes)

Level III

- B. **Indicate** if *each* factor below increases or decreases the endowment's ability to take risk:
- i. CU endowment's role in the university's operating budget
 - ii. The CU endowment's past performance as reflected in the year-end market values of the endowment

Justify *each* of your responses with *one* reason.

(6 minutes)

- C. **Prepare** the liquidity and time horizon constraints of CU endowment's IPS.

(4 minutes)

Two years have passed since Palmer was hired, and the endowment's investment portfolio now has an asset allocation of 55 percent global equities, 40 percent global fixed income, and 5 percent cash. A newly established goal of CU is to enhance its scholarship program in order to attract a larger number of top-rated students. The endowment investment committee asks Palmer to develop a funding strategy for the additional scholarships. Palmer suggests the CU endowment adopt a rolling three-year average spending rule, in which the 4 percent spending calculation is based on the average ending market value over the previous three years.

- D. **Justify** the adoption of a rolling three-year average spending rule by the CU endowment.

(3 minutes)

Palmer suggests the endowment investment committee consider adding alternative investments to improve the portfolio's returns and to offer greater diversification benefits. The endowment investment committee is willing to assume additional risk, but is opposed to investing in asset classes that significantly reduce the liquidity of the overall portfolio. Palmer suggests reducing global equities to 45 percent of the portfolio and global fixed income to 35 percent of the portfolio, and investing the proceeds equally in indirect real estate, commodity futures, and hedge funds. He compiles the data on the historical performance of the asset classes shown in Exhibit 3 and adjusts the data to approximate "net-of-fees" returns for a client of CU's size. Palmer expects these data will be representative of future investment performance.

Exhibit 3
Historical Data for the Period 1990 – 2006

| Measure | MSCI World Equity | Lehman Global Aggregate Bond | NAREIT Indirect Real Estate | GSCI Commodity | HFCI Hedge Funds |
|---|-------------------|------------------------------|-----------------------------|----------------|------------------|
| Annualized return (adjusted)* | 10.94% | 7.70% | 12.71% | 7.08% | 13.46% |
| Standard deviation | 14.65% | 3.91% | 12.74% | 19.26% | 5.71% |
| Sharpe ratio | 0.45 | 0.87 | 0.66 | 0.15 | 1.61 |
| Correlation with MSCI World Equity | 1.00 | 0.13 | 0.35 | –0.08 | 0.59 |
| Correlation with Lehman Global Aggregate Bond | 0.13 | 1.00 | 0.18 | 0.05 | 0.19 |

* Returns are on a “net-of-fees” basis.

E. **Evaluate** the impact of Palmer’s proposed asset allocation with reference to the portfolio’s:

- i. return
- ii. risk
- iii. liquidity

Note: No calculations are required.

(6 minutes)

Level III

QUESTION 6 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 23 MINUTES.

Pawtucket Mutual Life Insurance Co., a U.S.-based mutual insurance company, primarily underwrites term and whole life insurance. In 2005, the company sold a portion of its whole life business line and acquired a fixed-rate annuity business. These actions did not result in any changes in the company's regulatory status. Exhibit 1 reflects the business mix of Pawtucket Mutual for the last three years.

Exhibit 1
Pawtucket Mutual Life Insurance Co.
Revenue by Business Line and Duration
Years Ending 31 December

| Business Line | Revenue (\$ millions) | | | Duration of Liabilities |
|----------------------|-----------------------|---------|---------|-------------------------|
| | 2004 | 2005 | 2006 | 2006 |
| Whole life | \$2,000 | \$1,000 | \$1,100 | 14.2 |
| Term life | \$2,500 | \$2,750 | \$2,500 | 12.7 |
| Fixed-rate annuities | \$500 | \$1,300 | \$1,400 | 5.7 |

As a result of the change in business mix, the company's surplus has fallen from \$500 million to \$475 million and the duration of its liabilities has dropped from 12.6 to 11.1.

The board of directors has hired Samantha Leander, CFA, to analyze the impact of Pawtucket Mutual's changing business mix on the firm's operating and financial condition.

- A. **Identify** *two* constraints in the investment policy statement that are affected *solely* by the change in business mix using the information given in Exhibit 1. **Justify** your response with *one* reason for *each* constraint.

Answer Question 6-A in the Template provided on page 45.

(6 minutes)

- B. **Determine** whether Pawtucket Mutual's ability to take risk has increased or decreased based *solely* on the change in business mix. **Justify** your response with *two* reasons.

Answer Question 6-B in the Template provided on page 46.

(5 minutes)

The board asks Leander to assess the investment portfolio's asset allocation. The board provides Leander with a summary of Pawtucket Mutual's asset-liability statistics along with the investment portfolio's asset allocation, as shown in Exhibits 2 and 3. Pawtucket Mutual marks to market its portfolio.

Exhibit 2
Pawtucket Mutual Life Insurance Co.
Asset-Liability Statistics
Years Ending 31 December

| Statistic | 2004 | 2006 |
|-------------------------|------|------|
| Duration of liabilities | 12.6 | 11.1 |
| Duration of assets | 12.7 | 12.1 |
| Portfolio return | 5.7% | 5.4% |

Exhibit 3
Pawtucket Mutual Life Insurance Co.
Investment Portfolio Asset Allocation

| Sector | Current Allocation |
|---------------------------------|--------------------|
| Cash | 2% |
| Fixed income – investment grade | 31% |
| Fixed income – high yield | 11% |
| Mortgage-backed securities | 31% |
| Equities | 14% |
| Real estate | 11% |

Leander forecasts a rising interest rate environment along with widening credit spreads. She wishes to assess the effect of her forecasts on each of the following risks contained in Pawtucket Mutual's investment portfolio:

1. Valuation risk
 2. Cash flow volatility risk
 3. Credit risk
 4. Reinvestment risk
- C. **Discuss** the source of *each* risk contained in Pawtucket Mutual's investment portfolio based on Exhibits 2 and 3. **Indicate** the likely effect (positive, negative, or no effect) of *each* risk on Pawtucket Mutual's surplus if Leander's forecast is correct.

Answer Question 6-C in the Template provided on page 47.

(12 minutes)

Answer Question 6 on This Page

Template for Question 6-A

| | |
|---|---|
| Identify <i>two</i> constraints in the investment policy statement that are affected <i>solely</i> by the change in business mix using the information given in Exhibit 1. | Justify your response with <i>one</i> reason for <i>each</i> constraint. |
| 1. | |
| 2. | |

Answer Question 6 on This Page

Template for Question 6-B

| | |
|---|---|
| Determine whether Pawtucket Mutual's ability to take risk has increased or decreased based <i>solely</i> on the change in business mix. (circle one) | Justify your response with <i>two</i> reasons. |
| Increased | 1. |
| Decreased | 2. |

Answer Question 6 on This Page

Template for Question 6-C

| Risk | Discuss the source of <i>each</i> risk contained in Pawtucket Mutual's investment portfolio based on Exhibits 2 and 3. | Indicate the likely effect (positive, negative, or no effect) of <i>each</i> risk on Pawtucket Mutual's surplus if Leander's forecast is correct. (circle one) |
|------------------------------|--|--|
| 1. Valuation risk | | <div>Positive</div> <div>Negative</div> <div>No effect</div> |
| 2. Cash flow volatility risk | | <div>Positive</div> <div>Negative</div> <div>No effect</div> |
| 3. Credit risk | | <div>Positive</div> <div>Negative</div> <div>No effect</div> |
| 4. Reinvestment risk | | <div>Positive</div> <div>Negative</div> <div>No effect</div> |

Level III

QUESTION 7 HAS TWO PARTS (A, B) FOR A TOTAL OF 13 MINUTES.

The investment committee of China Pingshi Life Insurance Company (Pingshi) is considering including international fixed income and domestic real estate in its investment portfolio.

Sarah Yap, investment consultant to Pingshi, recommends a strategic asset allocation and a percentage-of-portfolio rebalancing strategy, as shown in Exhibit 1. Corridor widths are based on a fixed range of ± 10 percent of the target weight of each asset class.

Exhibit 1
China Pingshi Life Insurance Company
Recommended Strategic Asset Allocation

| Asset Class | Target Asset Class Weight | Corridor Width |
|----------------------------|---------------------------|----------------|
| Domestic equities | 15% | $\pm 1.5\%$ |
| Domestic fixed income | 50% | $\pm 5.0\%$ |
| International fixed income | 20% | $\pm 2.0\%$ |
| Domestic real estate | 15% | $\pm 1.5\%$ |
| | 100% | |

Several months later, a member of the investment committee asks Yap to consider the effects on optimal corridor widths resulting from the following revised market expectations:

- Long-term positive correlations of domestic fixed income with the other asset classes are expected to fall.
- International fixed income volatility is already relatively high and is expected to rise further due to increased foreign currency fluctuation. Pingshi's policy is not to hedge foreign currency risk.
- Liquidity in the domestic real estate market is expected to decline, and transaction costs are expected to rise.

A. **Determine**, for *each* revised market expectation, whether the stated asset class corridor widths in Exhibit 1 should be wider, unchanged, or narrower. **Justify** *each* of your responses with *one* reason.

Note: No calculations are required.

Answer Question 7-A in the Template provided on page 55.

(9 minutes)

Liang Xi, portfolio manager for Pingshi's domestic equity portfolio, has asked that he be permitted to invest a portion of the domestic equity allocation in risk-free securities. He indicates that the strategy for the domestic equities/risk-free securities mix would be based on Pingshi's forecast for the performance of the domestic equity market. Xi states that the strategy selected would be one of three types: a constant-mix strategy, a buy-and-hold strategy, or a constant-proportion portfolio insurance (CPPI) strategy.

Yap asks Xi to investigate the implications of his suggestion for the overall portfolio's risk and return, ignoring transaction costs. Xi decides to compare the return performance of:

- a constant-mix strategy allocated 90% to domestic equities and 10% to risk-free securities, and
- a CPPI strategy with a floor value of 10% of the current market value of the domestic equity portfolio.

Pingshi's forecast for the domestic equity market is for flat returns in the long term with periods of significant market volatility.

- B. **Compare** the expected performance of the constant-mix and CPPI strategies assuming Pingshi's forecast proves correct.

Note: No calculations are required.

(4 minutes)

Answer Question 7 on This Page

Template for Question 7-A

Note: No calculations are required.

| Asset class and revised market expectation | Determine, for <i>each</i> revised market expectation, whether the stated asset class corridor widths in Exhibit 1 should be wider, unchanged, or narrower. (circle one) | Justify <i>each</i> of your responses with <i>one</i> reason. |
|---|--|---|
| <p>Domestic fixed income:</p> <p>Long-term positive correlations of domestic fixed income with the other asset classes are expected to fall.</p> | <p>Wider</p> <p>Unchanged</p> <p>Narrower</p> | |
| <p>International fixed income:</p> <p>International fixed income volatility is already relatively high and is expected to rise further due to increased foreign currency fluctuation. Pingshi's policy is not to hedge foreign currency risk.</p> | <p>Wider</p> <p>Unchanged</p> <p>Narrower</p> | |
| <p>Domestic real estate:</p> <p>Liquidity in the domestic real estate market is expected to decline, and transaction costs are expected to rise.</p> | <p>Wider</p> <p>Unchanged</p> <p>Narrower</p> | |

Level III

QUESTION 8 HAS FOUR PARTS (A, B, C, D) FOR A TOTAL OF 14 MINUTES.

John Taylor is evaluating equity portfolio managers for the Xenius Corporation retirement plan. Asset Value Advisors (AVA) is a top quartile manager in the U.S. equity large-capitalization value category. AVA states that it uses the Russell 1000 Value Index as its benchmark.

Taylor uses returns-based style analysis to evaluate AVA's investment style and selects the following style benchmarks for the study:

1. Russell 1000 Value Index (large-capitalization)
2. Russell 1000 Growth Index (large-capitalization)
3. Russell 2000 Value Index (small-capitalization)
4. Russell 2000 Growth Index (small-capitalization)

Taylor analyzes data on AVA's rolling three-year monthly Sharpe style weights from 2002 to 2006. The results are provided in Exhibit 1. Taylor also calculates that between 2002 and 2006, AVA's style fit is 88 percent.

Exhibit 1
Asset Value Advisors
Returns-based Style Analysis: 2002 – 2006

| Style Index | Rolling Three-year Monthly Sharpe Style Weight | | | | |
|---------------------------|--|------|------|------|------|
| | 2002 | 2003 | 2004 | 2005 | 2006 |
| Russell 1000 Value Index | 98% | 96% | 96% | 97% | 96% |
| Russell 1000 Growth Index | 0% | 1% | 3% | 2% | 3% |
| Russell 2000 Value Index | 2% | 2% | 1% | 0% | 0% |
| Russell 2000 Growth Index | 0% | 1% | 0% | 1% | 1% |
| | 100% | 100% | 100% | 100% | 100% |

- A. **Determine** whether AVA's equity portfolios were actively managed between 2002 and 2006. **Support** your answer with *one* reason.

Note: No calculations are required.

(3 minutes)

- B. **Determine** whether AVA experienced significant style drift between 2002 and 2006. **Support** your answer with *one* reason.

(3 minutes)

Xenius recently revised the investment policy statement (IPS) for its retirement plan portfolio. The return objective for equities is to earn 1 percent above the return on a broad market index,

after portfolio management and trading expenses, with no more than 2 percent tracking error relative to the benchmark.

Taylor identifies an enhanced index manager that he expects would satisfy the IPS objectives for both return and risk. Taylor believes it is possible to improve the portfolio's risk-adjusted return by also adding active equity managers. He recommends a core-satellite portfolio strategy for the equity portion of the plan's portfolio as shown in Exhibit 2. Taylor determines that the active returns of the selected managers are not correlated.

Exhibit 2
Recommended Core-satellite Portfolio

| Equity Managers | Allocation | Expected Active Return* | Expected Active Risk | Fees |
|--------------------------|------------|-------------------------|----------------------|------|
| Enhanced index | 70.0% | 1.2% | 1.3% | 0.2% |
| Active A | 20.0% | 2.0% | 4.0% | 0.4% |
| Active B | 10.0% | 3.6% | 10.5% | 0.8% |
| Core-satellite portfolio | 100.0% | 1.6% | 1.6% | 0.3% |

*Returns are net of trading expenses and gross of fees.

- C. **Calculate** the information ratio of the core-satellite portfolio. **Show** your calculations.

(3 minutes)

- D. **Determine** whether Taylor's recommended core-satellite portfolio is appropriate for Xenius. **Justify** your response with *two* reasons specific to Xenius.

(5 minutes)

QUESTION 9 HAS ONE PART FOR A TOTAL OF 9 MINUTES.

Australia Invest magazine recently published a review of the one-year performance for Worldwide Metals Fund (WMF), an active fund of funds specializing in global mining sector funds. WMF is available only to Australian investors.

Exhibit 1 contains a summary of the WMF portfolio and one-year return decomposition in local and base currencies. Local index returns are presented in local currency.

Exhibit 1
Worldwide Metals Fund
Portfolio and One-year Return Decomposition

| Fund | Local Currency | Portfolio Weights | Local Currency | | | Base Currency (AUD) | |
|-------------------------------------|--------------------------|-------------------|-----------------------|-----------------|--------------------|-----------------------|-----------------|
| | | | Security Total Return | Weighted Return | Local Index Return | Security Total Return | Weighted Return |
| Proxidio Partners Metals Fund (PPM) | U.S. Dollar (USD) | 30% | 8.5% | 2.6% | 1.0% | 6.2% | 1.9% |
| South Capital Minerals Fund (SCM) | South African Rand (ZAR) | 45% | 15.4% | 6.9% | 10.7% | 3.4% | 1.5% |
| Collings Trust Mining Fund (CTM) | Australian Dollar (AUD) | 25% | 13.5% | 3.4% | 3.4% | 13.5% | 3.4% |
| Total | --- | 100% | --- | 12.9% | --- | --- | 6.8% |

All return figures are net of costs. There were no cash flows into or out of the portfolio during the one-year period.

Calculate *each* of the following components of return for the WMF portfolio:

- i. Market return
- ii. Currency
- iii. Security selection

Show your calculations.

(9 minutes)

Level III

QUESTION 10 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 19 MINUTES.

Greta Steiner, an analyst at Shopond Research, has been asked to develop an estimate of the aggregate operating profit margin for the companies in the S&P 500 Index. She is using the S&P 500 as a representation of the overall U.S. economy. Steiner first reviews the U.S. economic data presented in Exhibit 1. She notes that U.S. firms cannot raise prices to fully compensate for inflation because of the current elasticity of demand.

Exhibit 1
U.S. Economic Data

| Variables | Year | | | |
|--|------|------|------|---------------|
| | 2004 | 2005 | 2006 | 2007 Forecast |
| Capital expenditures growth rate (%) | 6.9 | 6.4 | 7.0 | 7.4 |
| Inflation rate (%) | 3.3 | 3.4 | 3.7 | 4.0 |
| Corporate tax rate (%) | 32.0 | 32.0 | 33.0 | 33.5 |
| Capacity utilization rate (%) | 76.1 | 76.5 | 76.9 | 77.3 |
| Three-month Treasury bill rate (%) | 2.2 | 3.9 | 4.8 | 5.0 |
| Depreciation expense (% of fixed assets) | 14.0 | 14.2 | 15.1 | 16.0 |
| Unit labor costs (% change) | 1.0 | -0.1 | -0.3 | -0.5 |

- A. i. **Identify** *three* variables from Exhibit 1 that are used to estimate the S&P 500 aggregate operating profit margin.
- ii. **Determine**, for *each* identified variable, the expected effect of the 2007 forecast on the S&P 500 aggregate operating profit margin.

Note: Consider each variable independently and assume all other variables remain constant.

- iii. **Justify** your answer to Part ii with *one* reason for *each* identified variable.

Answer Question 10-A in the Template provided on page 73.

(12 minutes)

A client of Shopond is considering adjusting her allocation to the U.S. equities market and has asked Steiner to estimate the nominal expected return for that market. Steiner decides to use the Grinold-Kroner model instead of the Gordon Growth model to forecast the expected return on U.S. equities. To implement the Grinold-Kroner model, Steiner gathers the data shown in Exhibit 2.

Exhibit 2
2007 Economic Expectations

| U.S. Data | |
|---|-------|
| Standard deviation of equities | 18% |
| U.S. equities integration factor | 0.8 |
| Dividend yield | 2% |
| Real long-term growth rate | 4% |
| Share repurchase yield | 1% |
| Per period % change in P/E ratio | 0.25% |
| Illiquidity premium | 0.1% |
| Global Data | |
| Sharpe ratio for global investment market (GIM) | 0.28 |
| Correlation coefficient GIM, U.S. equities | 0.8 |

- B. **Support** Steiner's decision to use the Grinold-Kroner model with *two* reasons, based on the information provided.

(4 minutes)

- C. **Calculate** the expected return on U.S. equities, using the Grinold-Kroner model, based on the data in Exhibit 1 and Exhibit 2. **Show** your calculations.

(3 minutes)

Answer Question 10 on This Page

Template for Question 10-A

| | | |
|--|--|---|
| <p>i. Identify <i>three</i> variables from Exhibit 1 that are used to estimate the S&P 500 aggregate operating profit margin.</p> | <p>ii. Determine, for <i>each</i> identified variable, the expected effect of the 2007 forecast on the S&P 500 aggregate operating profit margin.</p> <p>Note: Consider each variable independently and assume all other variables remain constant. (circle one)</p> | <p>iii. Justify your answer to Part ii with <i>one</i> reason for <i>each</i> identified variable.</p> |
| <p>1.</p> | <p>Increase</p> <p>Decrease</p> <p>No Change</p> | |
| <p>2.</p> | <p>Increase</p> <p>Decrease</p> <p>No Change</p> | |
| <p>3.</p> | <p>Increase</p> <p>Decrease</p> <p>No Change</p> | |