



**CFA  
LEVEL III**

**SAMPLE – CFA LEVEL III**

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### Question 1

Bob Hageman is the Chief Investment Officer for the pension fund of Wapitechnology Industries. Wapitechnology is a producer of a variety of customized software solutions for service and distribution industries, currently entering its second decade in business. Wapitechnology offers a generous defined benefit pension plan, but because of the firm's comparatively recent founding and the industry in which it operates, Wapitechnology has a very young and mobile workforce. Few employees have vested in its pension plan, and no employee has acquired sufficiently long service to retire.

The demographics of the defined benefit plan's beneficiaries give Wapitechnology an extremely long time horizon for the management of its pension fund. Bob Hageman has suggested to Yvette Vargas, Wapitechnology's Chairman and Chief Executive, that they should change the investment policy statement for the pension fund to accommodate a higher risk level. Specifically, Hageman thinks that Wapitechnology should increase its asset allocation to equities because the exceptionally long time horizon of the pension fund enables it to take on an unusually high degree of risk in its investment strategy.

Vargas wonders about the suitability of passive management for the Wapitechnology pension fund. She points out, "Asset allocation is more likely to favor passive management for taxable investors than for non-taxable investors because of reduced portfolio turnover in a passive management approach."

Vargas cites the statistics, saying, "On average after expenses, historical data shows that active management does not outperform passive management." Hageman reminds Vargas, "International equity markets are less informationally efficient than the U.S. market, so a U.S. based investor would be wise to pursue an active strategy abroad to exploit the informational inefficiencies, rather than a passive strategy."

Since Vargas is interested in passive investing, Hageman presents the following indexes as possible benchmarks for a passive portfolio:

Index	Region	Type
Standard & Poor's 500 Composite (S&P 500)	US	capitalization-weighted
Value Line Composite Average	UK	equally weighted
Nikkei Stock Average	Japan	value-weighted
CAC 40	France	capitalization-weighted
Dow Jones Industrial Average (DJIA)	US	price-weighted

He also details the advantages and disadvantages of different types of indexes:

Statement 1: Price-weighted indexes are biased in that higher priced stocks have a greater impact on the index's value than lower priced stocks, but the price of a stock is somewhat arbitrary and dependent on splits, stock dividends, and repurchases.

Statement 2: The free float-adjusted index is considered the best type by many investors because it removes the float from the index calculation.

Statement 3: A market capitalization-weighted index automatically adjusts for stock splits of individual firms.

Statement 4: A price-weighted index must be periodically rebalanced.

Hageman explains to Vargas that equity investment approaches can be described by tracking risk and information ratio. Hageman explains, "Tracking risk is the excess of fund return relative to the appropriate benchmark." He suggests to Vargas that the Wapitechnology pension fund's long time horizon enables them to take on significant tracking risk.

Vargas suggests that she thinks they should pay close attention to the information ratio of any equity strategy or manager they consider for the pension fund. She explains, "Historically, the information ratio has been highest for active management and lowest for passive management, with semi-active management falling in the middle."

Hageman tells Vargas that he has interviewed a wide range of equity managers for potential addition to Wapitechnology's stable of managers. He adds that Cytologic Fund Management has shown an information ratio of 0.082, but says that their tracking risk recently has been lower than the historical average. "If their tracking risk remains low, that would lower their information ratio."

Part 1)

The *best* description of the accuracy of Hageman's statements regarding the advantages and disadvantages of different types of equity indexes is:

- A) Statement 2 is incorrect, Statement 1, 3 and 4 are correct.
- B) Statements 2 and 4 are incorrect, Statements 1 and 3 are correct.
- C) Statements 1 and 3 are incorrect, Statements 2 and 4 are correct.

Part 2)

Is Hageman *correct* with regard to his definition of tracking risk and the impact of tracking risk on the information ratio?

<u>Definition</u>	<u>Impact</u>
A) Incorrect	Correct
B) Incorrect	Incorrect
C) Correct	Incorrect

Part 3)

The primary advantage of a price-weighted index is that it:

- A) is easiest to mimic with minimal tracking risk.
- B) implicitly assumes that each investor holds one share of each stock in the index.
- C) is computationally simple.

Part 4)

Is Vargas *correct* in her statements about the information ratio and the advantage of passive management for taxable investors?

Information ratio Passive management

- |              |           |
|--------------|-----------|
| A) Correct   | Correct   |
| B) Incorrect | Correct   |
| C) Incorrect | Incorrect |

Part 5)

Which of the following *best* describes of the accuracy of the index data in the table?

- A) The Value Line and CAC 40 are incorrect, the others are correct.
- B) The Nikkei and Value Line are incorrect, and the others are correct.
- C) The CAC 40 and the Nikkei are incorrect, the others are correct.

Part 6)

Are Vargas and Hageman *correct* in their descriptions of active versus passive strategies with respect to the historical data and international investors?

- | <u>Vargas</u> | <u>Hageman</u> |
|---------------|----------------|
| A) Incorrect  | Incorrect      |
| B) Correct    | Correct        |
| C) Correct    | Incorrect      |

Question 2

Jane Hiatt and Penny Hoskins have responsibility for interest rate and currency risk management for the Rensselaer Corporation, a large multinational firm based in the Midwestern United States.

Due to an increase in global economic growth, Rensselaer has seen its sales increase and is planning to expand its U.S. factory at a cost of \$30,000,000. The factory expansion will be financed at a floating interest rate of LIBOR plus 200 basis points, with payments made quarterly over seven years. Hiatt expects that Rensselaer will begin the expansion in six months and will receive the \$30,000,000 in financing at that point in time. She is concerned, however, that global interest rates will increase in the interim and would like to have the option to convert the loan's interest rate to a fixed rate in six months. Hiatt evaluates the forecasts for future swap fixed rates as well as the current terms of various swaptions, provided in the following table. The swaptions are for a 7-year swap where the floating interest rate is LIBOR flat.

Fixed rate for payer's swaption that matures in six months	7.00%
Fixed rate for receiver's swaption that matures in six months	7.10%
Projected Swap Fixed Rate in six months	7.20%
Fixed rate for payer's swaption that matures in seven years	8.40%
Fixed rate for receiver's swaption that matures in seven years	8.50%
Projected Swap Fixed Rate in seven years	9.20%

Rensselaer has just opened a factory in Germany that will sell products locally, earning projected cash flows of €10,000,000 on a quarterly basis. In order to convert these cash flows into dollars, Hoskins suggests that Rensselaer enter into a currency swap without an exchange of notional principal where euros will be exchanged for dollars. Hoskins contacts a currency swap dealer and reports the following

exchange rate and annual swap fixed interest rates. These rates are for an exchange of cash flows starting in three months, which is approximately when Rensselaer will receive its next euro cash flow from its German operation. The maturity of the swap will be two years, because Hoskins does not feel comfortable projecting cash flows from the German factory beyond the next two years.

Exchange rate (EUR per dollar)	0.72
Swap interest rate in U.S. dollars	3.40%
Swap interest rate in euros	5.80%

Part 1)

Given her interest rate forecasts, which of the following is the *most likely* position Hiatt should recommend Rensselaer take to hedge the financing of the factory expansion?

- A) Buy a seven year maturity payer swaption.
- B) Buy a six month maturity payer swaption.
- C) Buy a six month maturity receiver swaption.

Part 2)

Assume the firm buys the appropriate swaption and Hiatt's interest rate forecasts prove correct. Determine which of the following is *closest* to the net interest payment Rensselaer will make on the factory expansion loan in six months.

- A) \$675,000.
- B) \$682,500.
- C) \$690,000.

Part 3)

If Hiatt's interest rate forecasts prove correct, and the appropriate hedge is enacted, which of the following *best* represents the changes in Rensselaer's risk exposure? The firm's cash flow risk:

- A) decreases and its market value risk decreases.
- B) decreases and its market value risk increases.
- C) increases and its market value risk decreases.

Part 4)

What are the periodic cash flows resulting from Rensselaer's hedge of the German factory sales?

- A) \$8,141,762.
- B) \$4,264,706.
- C) \$13,888,889.

Part 5)

Suppose that Rensselaer's currency swap can be structured with fixed or floating payments. If Hiatt's interest rate concerns are correct, which of the following would be the ideal position for Rensselaer to take in the currency swap? From Rensselaer's perspective, the swap should be structured with a:

- A) fixed dollar interest rate and a floating euro interest rate.
- B) floating dollar interest rate and a fixed euro interest rate.
- C) floating dollar interest rate and a floating euro interest rate.

Part 6)

In the currency swap, Rensselaer is exposed to:

- A) credit risk.
- B) credit risk and economic risk.
- C) neither credit risk nor economic risk.



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[info@finstructor.in](mailto:info@finstructor.in) | Ph: +91 - 99202 22792 | [www.finstructor.in](http://www.finstructor.in)

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