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RISK MANAGEMENT

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CASE STUDY SERIES

-By Sanjay Saraf Sir

Case Study 9 Question

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KNOWLEDGE IN DEPTH

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Hiram Life (Hiram)

Hiram Life (Hiram), a large multinational insurer located in Canada, has received permission to increase its ownership in an India- based life insurance company, LICIA, from 26% to 49%. Before completing this transaction, Hiram wants to complete a risk assessment of LICIA's investment portfolio. Judith Hamilton, Hiram's chief financial officer, has been asked to brief the management committee on investment risk in its India- based insurance operations.

LICIA's portfolio, which has a market value of CAD 260 million, is currently structured as shown in Exhibit 1. Despite its more than 1,000 individual holdings, the portfolio is invested predominantly in India. The Indian government bond market is highly liquid, but the country's mortgage and infrastructure loan markets, as well as the corporate bond market, are relatively illiquid. Individual mortgage and corporate bond positions are large relative to the normal trading volumes in these securities. Given the elevated current and fiscal account deficits, Indian investments are also subject to above- average economic risk.

Hamilton begins with a summary of the India-based portfolio. Exhibit 1 presents the current portfolio composition and the risk and return assumptions used to estimate value at risk (VaR).

Exhibit 1 :Selected Assumptions for LICIA's Investment Portfolio

	Allocation	Average Daily Return	Daily Standard Deviation
India government securities	50%	0.015%	0.206%
India mortgage/infrastructure loans	25%	0.045%	0.710%
India corporate bonds	15%	0.025%	0.324%
India equity	10%	0.035%	0.996%

Infrastructure is a rapidly growing asset class with limited return history; the first infrastructure loans were issued just 10 years ago.

Hamilton's report to the management committee must outline her assumptions and provide support for the methods she used in her risk assessment. If needed, she will also make recommendations for rebalancing the portfolio to ensure its risk profile is aligned with that of Hiram.

Hamilton develops the assumptions shown in Exhibit 2, which will be used for estimating the portfolio VaR.

Exhibit 2 VaR Input Assumptions for Proposed CAD 260 Million Portfolio

Method	Average Return Assumption	Standard Deviation Assumption
Monte Carlo simulation	0.026%	0.501%
Parametric approach	0.026%	0.501%
Historical simulation	0.023%	0.490%

Hamilton elects to apply a one-day, 5% VaR limit of CAD 2 million in her risk assessment of LICIA's portfolio. This limit is consistent with the risk tolerance the committee has specified for the Hiram portfolio.

The markets' volatility during the last 12 months has been significantly higher than the historical norm, with increased frequency of large daily losses, and Hamilton expects the next 12 months to be equally volatile.

She estimates the one- day 5% portfolio VaR for LICIA's portfolio using three different approaches:

Exhibit 3 VaR Results over a One- Day Period for Proposed Portfolio

Method	5% VaR
Monte Carlo simulation	CAD 2,095,565
Parametric approach	CAD 2,083,610
Historic simulation	CAD 1,938,874

The committee is likely to have questions in a number of key areas—the limitations of the VaR report, potential losses in an extreme adverse event, and the reliability of the VaR numbers if the market continues to exhibit higher- than- normal volatility. Hamilton wants to be certain that she has thoroughly evaluated the risks inherent in the LICIA portfolio and compares them with the risks in Hiram's present portfolio.

Hamilton believes the possibility of a ratings downgrade on Indian sovereign debt is high and not yet fully reflected in securities prices. If the rating is lowered, many of the portfolio's holdings will no longer meet Hiram's minimum ratings requirement. A downgrade's effect is unlikely to be limited to the government bond portfolio. All asset classes can be expected to be affected to some degree. Hamilton plans to include a scenario analysis that reflects this possibility to ensure that management has the broadest possible view of the risk exposures in the India portfolio.

MULTIPLE CHOICE QUESTIONS

1. Given Hamilton's expectations, which of the following models is most appropriate to use in estimating portfolio VaR?

A. Parametric method

B. Historical simulation method

C. Monte Carlo simulation method

2. Which risk measure is Hamilton most likely to present when addressing the committee's concerns regarding potential losses in extreme stress events?

A. Delta

B. Standard Deviation

C. Conditional VaR

3. The scenario analysis that Hamilton prepares for the committee is most likely a:

A. stress test.

B. historical scenario.

C. hypothetical scenario.

4. The scenario analysis that Hamilton prepares for the committee is a valuable tool to supplement VaR because it:

A. incorporates historical data to evaluate the risk in the tail of the VaR distribution.

B. enables Hamilton to isolate the risk stemming from a single risk factor—the ratings downgrade.

C. allows the committee to assess the effect of low liquidity in the event of a ratings downgrade.

5. Using the data in Exhibit 2, the portfolio's annual 1% parametric VaR is closest to:

A. CAD 17 million.

B. CAD 31 million.

C. CAD 48 million.

6. What additional risk measures would be most appropriate to add to Hamilton's risk assessment?

A. Delta

B. Duration

C. Tracking error