Lesson 4.1 Quiz: Measuring Market Risk

Module 4: The Risk Problem

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Digital Finance — BSc Course (v2026.05)

Q1: VaR Definition

What does a "95% daily VaR of CHF 10,000" mean?

A. You will gain at least CHF 10,000 on 95% of days
B. You will lose exactly CHF 10,000 every day
C. Your maximum possible loss is CHF 10,000
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Q2: Sorted Returns Intuition

You have 1,000 days of historical returns sorted from worst to best. To find the 95% VaR, which value do you look at?

A. The 950th return
B. The 50th worst return
C. The 500th worst return
D. The 5th worst return

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Q3: ES vs VaR

What is the key difference between Expected Shortfall (ES) and VaR?

A. ES is always smaller than VaR
B. VaR captures tail risk better than ES
C. ES only applies to bond portfolios
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Q4: Volatility Definition

In finance, "volatility" most commonly refers to:

A. The maximum daily price change
B. The correlation between two assets
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Q5: Volatility Clustering

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B. All stocks have the same volatility
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Q6: VaR Calculation

A portfolio of CHF 200,000 has a daily volatility (σ) of 1.5%. Using the variance-covariance method, what is the approximate 95% daily VaR? (Hint: 95% VaR $\approx 1.65 \times \sigma$)

- A CHF 9,900
- B CHF 4,950
- C CHF 3,000
- D CHF 6,600

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Q7: ES from Sorted Returns

You sort 200 daily returns from worst to best. The 10 worst are: -5.1%, -4.3%, -3.9%, -3.5%, -3.2%, -2.8%, -2.5%, -2.3%, -2.1%, -1.9%. What is the 95% Expected Shortfall?

- (A) -1.9%
- (B) -5.1%
- (C) -3.16%
- (D) -2.1%

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A stock has a daily volatility of 2%. What is the approximate annualized volatility? (Assume 252 trading days.)

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- B 504%
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Q9: Monte Carlo Concept

In a Monte Carlo VaR simulation with 10,000 scenarios, how do you find the 99% VaR?

- (A) Take the average of all 10,000 scenarios
- (B) Take the 100th worst outcome
- (C) Take the single worst outcome
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Q10: EWMA vs Rolling Window

After a sudden market shock, which volatility estimate reacts faster?

- (A) Both react at the same speed
- (B) An EWMA estimate with $\lambda = 0.94$
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Q11: Correlation Interpretation

Two assets have a correlation of -0.3. What does this mean?

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Q12: Portfolio Diversification

Two stocks each have 20% volatility. If their correlation is 0.0 (completely uncorrelated) and you invest 50% in each, what is the portfolio volatility?

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Q13: Fat Tails Impact

A risk manager uses the variance-covariance VaR method (which assumes normally distributed returns). Real returns have fat tails with excess kurtosis of 5. What is the most likely consequence?

- **A** The model underestimates VaR (too optimistic)
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Q14: Method Comparison

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Q15: Crisis Correlations

During the 2008 financial crisis, correlations between most asset classes increased sharply. What does this imply for VaR models that use historical correlations from calm periods?

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Q16: Systematic vs Diversifiable Risk

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B. Idiosyncratic risk
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Q17: VaR Limitation

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- B. Portfolio Y's worst case is irrelevant to risk measurement
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Q18: GARCH Concept

A risk analyst says: "After yesterday's 4% drop, I expect tomorrow's volatility to be higher than usual." Which concept supports this statement?

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Q19: VaR Method Selection

A bank manages a complex portfolio of stocks, bonds, derivatives, and currencies. Which VaR method is most appropriate and why?

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B. All methods give identical results for complex portfolios
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Q20: Regulatory Shift

Basel III regulations shifted from VaR to Expected Shortfall (ES) as the primary risk measure for banks. What is the most compelling reason for this change?

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- (B) ES always gives a lower (less conservative) risk estimate
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