Lesson 4.4 Quiz: The New Risk Landscape

Module 4: The Risk Problem

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Digital Finance — BSc Course

Question 1

A bank's Chief Risk Officer states: "Cyber risk is fundamentally different from market risk because it is adversarial." Which of the following **best** explains what "adversarial" means in this context?

- (A) Cyber losses follow a normal distribution, unlike market losses
- (B) Cyber threats originate from intelligent actors who adapt their methods in response to defenses
- (C) Cyber risk affects only technology firms, not financial institutions
- (D) Cyber losses are always larger than market losses

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Answer: (B) Unlike market risk, where price moves are not directed at you personally, cyber attackers deliberately adapt their tactics to exploit specific weaknesses. This adversarial nature makes historical patterns unreliable predictors of future attacks.

Question 2

The NIST Cybersecurity Framework organizes security activities into five core functions. Which of the following lists them in the **correct** order?

A. Protect, Identify, Respond, Detect, Recover
B. Identify, Protect, Detect, Respond, Recover
C. Detect, Protect, Identify, Recover, Respond
D. Identify, Detect, Protect, Respond, Recover

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- (C) Detect, Protect, Identify, Recover, Respond
- (D) Identify, Detect, Protect, Respond, Recover

Answer: (B) The NIST CSF functions are: Identify (understand your assets and risks), Protect (implement safeguards), Detect (discover incidents), Respond (contain and mitigate), Recover (restore normal operations). The order reflects a logical lifecycle.

Question 3

A security architect proposes implementing zero-trust architecture at a bank. A board member asks: "What is the core assumption of zero trust?" Which answer is **most accurate**?

- A. All employees inside the corporate network can be trusted, but external users cannot
- B. No user, device, or network segment is inherently trustworthy — every access request must be verified
- C. The firewall is the only layer of defense needed to protect internal systems
- D. Zero trust means eliminating all passwords and using biometrics exclusively

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Answer: (B) Zero trust abandons the traditional "castle-and-moat" model. It assumes any component — internal or external — may be compromised, and requires continuous authentication and authorization for every request.

Question 4

A DeFi protocol suffers a major loss because the price oracle it relied on reported an incorrect ETH price for 30 seconds. This is an example of which type of risk?

A. Governance risk
B. Composability risk
C. Oracle risk
D. Transition risk

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Answer: (C) Oracle risk arises when smart contracts receive incorrect external data. A 30-second price discrepancy was sufficient for attackers to trigger unintended liquidations or extract value before the oracle corrected.

Question 5

In an order book, the **bid-ask spread** represents which of the following?

A. The total volume of all orders in the book
B. The difference between the highest buy order and the lowest sell order
C. The average price of all executed trades in the last minute
D. The maximum daily price movement allowed by the exchange

Question 5

In an order book, the **bid-ask spread** represents which of the following?

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- (C) The average price of all executed trades in the last minute
- (D) The maximum daily price movement allowed by the exchange

Answer: (B) The bid-ask spread is the gap between the best bid (highest price a buyer will pay) and the best ask (lowest price a seller will accept). It represents the cost of immediate execution and is a key measure of market liquidity.

Question 6

A FinTech company maps its cybersecurity program to the NIST CSF. It has strong firewalls and encryption (Protect) and a rapid incident response team (Respond), but it has never conducted an asset inventory or threat assessment. Which NIST function is **missing**?

- A Detect
- B Recover
- C Identify
- D Protect

Question 6

A FinTech company maps its cybersecurity program to the NIST CSF. It has strong firewalls and encryption (Protect) and a rapid incident response team (Respond), but it has never conducted an asset inventory or threat assessment. Which NIST function is **missing**?

- (A) Detect
- (B) Recover
- (C) Identify
- (D) Protect

Answer: (C) The Identify function includes asset management, risk assessment, and threat identification. Without knowing what assets you have and what threats they face, your protection and response capabilities may be misallocated or incomplete.

Question 7

A DeFi lending protocol accepts tokenized stablecoin as collateral. That stablecoin itself depends on an underlying lending pool, which in turn relies on a price oracle. If the oracle fails, what is the likely sequence of events?

- (A) The lending protocol automatically switches to a backup oracle with no impact
- (B) The stablecoin may depeg, triggering collateral shortfall in the lending protocol, causing cascading liquidations across all downstream protocols
- (C) Only the oracle provider suffers losses; the lending protocol is unaffected
- (D) The blockchain halts all transactions until the oracle is repaired

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Answer: (B) This is a classic composability risk cascade. The oracle failure propagates through the stablecoin's collateral mechanism to the lending protocol to every protocol that uses the lending protocol's tokens. Each layer amplifies the shock.

Question 8

An institutional trader needs to sell €5 million of a mid-cap stock. The current order book shows a best bid of €50.00 with 2,000 shares, and the next bid levels are at €49.95, €49.90, and €49.80. What risk does the trader face?

- The order will execute entirely at €50.00
- The order will "walk the book" — each successive block executes at progressively lower prices, resulting in an average price below €50.00
- The exchange will reject the order because it exceeds the daily limit
- The spread will narrow as the order absorbs liquidity

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Answer: (B) A large sell order exceeding the top-of-book volume will consume liquidity at each successive price level, resulting in **execution slippage**. The average execution price will be below the initially displayed best bid. This is a core microstructure risk for institutional traders.

Question 9

A portfolio manager holds shares in a major coal mining company. Regulators announce a carbon tax of €80 per tonne of CO_2, effective in two years. This regulatory change is an example of which type of climate risk?

- A Physical risk — acute event
- B Physical risk — chronic shift
- C Transition risk — policy-driven
- D Transition risk — technology-driven

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- (D) Transition risk — technology-driven

Answer: (C) A carbon tax is a policy instrument that increases the cost of carbon-intensive activities. This is transition risk (the financial impact of moving to a low-carbon economy), specifically driven by regulatory policy rather than technology or market shifts.

Question 10

A bank conducts a climate stress test under the NGFS "Disorderly Transition" scenario. Under this scenario, which combination of risks is **most likely**?

- A. Low physical risk, low transition risk
- B. Low physical risk, high transition risk
- C. High physical risk, low transition risk
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Answer: (B) In a disorderly transition scenario, aggressive but delayed climate policies are implemented suddenly, creating high transition risk (abrupt repricing of carbon-intensive assets). However, because action is eventually taken, warming is limited, so physical risk is relatively lower than in a "no policy" world.

Question 11

During a flash crash, the price of an ETF drops 8% in 90 seconds and recovers within 5 minutes. A risk manager's daily VaR model shows a 2% daily loss limit at the 99% confidence level. What does this event reveal about the model?

- (A) The model is correct — the crash was within the 1% tail
- (B) The model fails to capture intraday liquidity risk and microstructure dynamics; the realized intraday loss far exceeds the daily VaR
- (C) Daily VaR models are designed to capture flash crashes and this was an expected outcome
- (D) The VaR model should be replaced with a CAPM-based model

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Answer: (B) Daily VaR measures the worst expected loss over a full day at a given confidence level. Flash crashes expose intraday risk that daily models miss entirely. A stop-loss triggered during the crash could realize losses far beyond the daily VaR before prices recover.

Question 12

A cybersecurity consultant argues that traditional operational risk models (e.g., loss distribution approach) are inadequate for cyber risk. Which of the following is the **strongest** argument supporting this claim?

- (A) Cyber losses are always small and frequent, unlike operational losses
- (B) Cyber threat actors evolve their methods, making historical loss data a poor predictor of future loss severity and frequency
- (C) Operational risk models already account for all technology-related risks
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Answer: (B) The non-stationary, adversarial nature of cyber risk means that historical loss distributions underestimate future tail risks. A novel zero-day exploit has no historical precedent. This fundamentally challenges the loss distribution approach, which relies on fitting parametric distributions to historical data.

Question 13

An attacker uses a flash loan to borrow 1 million governance tokens, votes to drain a protocol's treasury, executes the proposal, and returns the tokens — all in a single transaction. Which defense mechanism would **most effectively** prevent this attack?

- (A) Increasing the total supply of governance tokens
- (B) Requiring tokens to be locked (vote-escrowed) for a minimum period before they can be used to vote
- (C) Removing the governance mechanism entirely
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Answer: (B) Vote-escrow mechanisms require tokens to be locked for a period (e.g., weeks or months) before they carry voting power. Flash-borrowed tokens cannot satisfy this requirement because they must be returned within the same transaction. This directly neutralizes the attack vector.

Question 14

A market maker posts bids at €99.90 and asks at €100.10, earning a €0.20 spread per round trip. During a sudden news event, the stock drops to €98.00. The market maker's outstanding bid at €99.90 is filled by aggressive sellers. What happened?

- The market maker earned the spread as intended
- The market maker suffered **adverse selection**: informed sellers traded against the stale bid, resulting in an immediate inventory loss
- The exchange cancelled the market maker's orders automatically
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Answer: (B) Adverse selection occurs when a counterparty trades against you because they have better information. The market maker's bid at €99.90 was "stale" — it did not yet reflect the news. Informed sellers hit this bid, and the market maker now holds stock worth €98.00, resulting in a loss of €1.90 per share.

Question 15

A pension fund holds a diversified portfolio including fossil fuel equities, renewable energy stocks, and government bonds. If a "carbon bubble" bursts (fossil fuel reserves are repriced as stranded assets), which of the following portfolio effects is **most likely**?

- (A) All three asset classes decline equally
- (B) Fossil fuel equities decline sharply; renewable energy stocks may appreciate; government bonds are relatively unaffected
- (C) Renewable energy stocks decline because they are in the same sector as fossil fuels
- (D) Government bonds decline most because governments depend on fossil fuel tax revenue

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Answer: (B) A carbon bubble burst would reprice fossil fuel reserves downward (stranded assets), likely benefiting renewable energy companies (substitution effect). Government bonds in most diversified economies would be less directly affected. This illustrates why climate risk requires sector-level analysis, not just portfolio-level VaR.

Question 16

A DeFi protocol uses a single oracle for its ETH/USD price feed. A risk analyst recommends switching to a multi-source oracle with time-weighted average pricing (TWAP). Which specific risk does each improvement address?

- **A** Multi-source addresses governance risk; TWAP addresses composability risk
- **B** Multi-source addresses single-point-of-failure risk; TWAP addresses short-duration price manipulation on low-liquidity venues
- **C** Both address only smart-contract bug risk
- **D** Multi-source increases gas costs but does not reduce risk; TWAP introduces latency risk

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Answer: (B) Multi-source oracles aggregate prices from independent feeds, eliminating the single-point-of-failure risk (if one source is manipulated, the others dilute its effect). TWAP averages prices over multiple blocks, making it expensive for an attacker to sustain a manipulated price long enough to affect the time-weighted average.

Question 17

A regulator proposes that all DeFi protocols must implement a "kill switch" — a centralized mechanism that allows a designated authority to pause or shut down the protocol in an emergency. Evaluate the trade-offs. Which concern is **most significant**?

- A The kill switch would make the protocol faster
- B A centralized kill switch reintroduces the single point of failure and censorship risk that DeFi was designed to eliminate, while potentially improving crisis response
- C The kill switch would have no effect because DeFi protocols cannot be paused
- D The kill switch would only benefit the regulator, with no impact on users

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Answer: (B) A kill switch creates a fundamental tension: it improves crisis response capability but reintroduces centralized control. The designated authority becomes a target for attackers and a point of censorship. This trade-off between resilience and decentralization is one of the defining debates in DeFi regulation.

Question 18

A bank's risk committee is debating whether to integrate climate risk into its standard VaR model or to treat it as a separate scenario analysis. Which argument **best** supports treating climate risk through scenario analysis rather than VaR?

- A VaR already captures all risk types, so scenario analysis is redundant
- B Climate risk is characterized by deep uncertainty, non-stationarity, and long time horizons that make historical distribution fitting unreliable; scenario analysis explores multiple plausible futures without requiring distributional assumptions
- C Scenario analysis is simpler to implement and requires no data
- D Climate risk is too small to affect VaR at the 99% confidence level

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- (D) Climate risk is too small to affect VaR at the 99% confidence level

Answer: (B) VaR relies on fitting distributions to historical data, but climate risk has no historical precedent at current scales. The transition to a low-carbon economy is a structural shift, not a stationary risk factor. Scenario analysis (e.g., NGFS scenarios) explicitly models multiple possible futures, making it better suited to deep uncertainty.

Question 19

After a flash crash, regulators consider imposing a "speed bump" — a mandatory 50-millisecond delay on all orders. A market maker argues this will reduce market quality. Evaluate the market maker's likely concern. Which argument is **most valid**?

- (A) Speed bumps would prevent all flash crashes entirely
- (B) The delay would reduce the market maker's ability to update stale quotes quickly, increasing their adverse selection risk, which would lead to wider spreads and less liquidity
- (C) The delay would only affect retail investors, not professional traders
- (D) Market quality always improves when trading is slower

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Answer: (B) Market makers manage adverse selection risk by quickly canceling or updating stale quotes when new information arrives. A mandatory delay prevents this, increasing the risk of being "picked off" by faster traders. To compensate, market makers widen spreads, increasing transaction costs for all participants. This is a real trade-off debated in market structure regulation.

Question 20

A Chief Risk Officer argues that cyber risk, DeFi risk, and climate risk should be managed in separate departments with separate models, because they are fundamentally different risk types. A junior analyst disagrees, arguing for an integrated approach. Which argument **best** supports the analyst's position?

- **A** The three risks are identical and should be modeled with the same VaR parameters
- **B** Under stress, these risks become correlated — a cyberattack during a climate event, or a DeFi composability failure during a market crash — and siloed models cannot capture cross-risk amplification
- **C** Integrated management is cheaper because it requires fewer staff
- **D** Regulators require all risks to be managed by a single department

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Answer: (B) The key insight is that correlations between these risk types increase under stress. A siloed approach may correctly estimate each risk in isolation but miss the compound scenarios where multiple risks materialize simultaneously. Integrated enterprise risk management captures these cross-risk interactions that amplify systemic losses.