Lesson 4.3 Quiz: Institutional Risk Management

Module 4: The Risk Problem

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Digital Finance — BSc Course

Q1: Three Pillars of Basel

Which of the following is **not** one of the three pillars of the Basel framework?

A. Minimum capital requirements
B. Supervisory review process
C. Deposit insurance schemes
D. Market discipline (disclosure)

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- (A) Minimum capital requirements
- (B) Supervisory review process
- (C) Deposit insurance schemes
- (D) Market discipline (disclosure)

Answer: (C) Deposit insurance is a separate regulatory mechanism. The three Basel pillars are: (1) minimum capital, (2) supervisory review, and (3) market discipline through public disclosure.

Q2: Purpose of Risk Weights

What is the primary purpose of **risk weights** in the Basel framework?

A. To determine the interest rate a bank charges on loans
B. To convert gross exposures into risk-adjusted equivalents for capital calculation
C. To set the maximum size of any single loan
D. To calculate the bank's profit margin on each asset

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Answer: (B) Risk weights reflect the relative riskiness of different asset classes. Multiplying exposure by the risk weight gives the Risk-Weighted Asset (RWA) value used in the capital adequacy calculation.

Q3: CET1 Capital

Which of the following **best describes** Common Equity Tier 1 (CET1) capital?

- (A) Subordinated debt with a maturity greater than 5 years
- (B) Contingent convertible bonds (CoCos) that convert to equity in a crisis
- (C) Common shares and retained earnings — the highest-quality loss-absorbing capital
- (D) All forms of regulatory capital combined (Tier 1 + Tier 2)

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Answer: (C) CET1 consists of common shares and retained earnings. It is the highest-quality capital because it absorbs losses first and has no maturity or redemption requirement.

Q4: Expected vs. Unexpected Loss

In a bank's credit portfolio, **expected losses** are covered by which mechanism?

A. Regulatory capital (CET1)
B. Loan loss provisions priced into loan spreads
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Answer: (B) Expected losses are the mean of the loss distribution and are covered by loan loss provisions (reserves), which are funded from the interest spread charged to borrowers. Capital covers *unexpected* losses.

Q5: LCR Purpose

The **Liquidity Coverage Ratio (LCR)** is designed to ensure that a bank can:

A. Generate sufficient profit over a 12-month period
B. Survive a 30-day severe liquidity stress scenario
C. Maintain a leverage ratio above 3%
D. Avoid all credit losses for one quarter

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Answer: (B) The LCR requires banks to hold enough High-Quality Liquid Assets (HQLA) to cover total net cash outflows over a 30-day severe stress scenario. LCR $\geq$ 100%.

Q6: Operational Risk Definition

Under Basel, which of the following is classified as **operational risk**?

- A borrower defaults on a corporate loan
- The bank's bond portfolio loses value due to rising interest rates
- A rogue trader circumvents internal controls and causes unauthorized losses
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Answer: (C) Operational risk arises from failed internal processes, people, or systems. A rogue trader bypassing controls is a classic people/process failure. (A) is credit risk, (B) is market risk, (D) is reputational risk (excluded from Basel operational risk).

Q7: RWA Calculation – Basic

A bank holds \$50M in government bonds (0% risk weight) and \$200M in corporate loans (100% risk weight). What is the bank's total RWA?

A. \$50M
B. \$200M
C. \$250M
D. \$125M

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Answer: (B) RWA = \$50M $\times$ 0% + \$200M $\times$ 100% = \$0 + \$200M = \$200M. Government bonds at 0% risk weight contribute nothing to RWA.

Q8: CAR Calculation

A bank has CET1 capital of $9M, AT1 of $2M, Tier 2 of $3M, and total RWA of $140M. What is the Capital Adequacy Ratio?

- A. 6.43%
- B. 7.86%
- C. 10.00%
- D. 14.00%

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Answer: (C) CAR = (9 + 2 + 3) / 140 = 14 / 140 = 10.00%. This exceeds the 8% minimum, and the CET1 ratio = 9/140 = 6.43% (above the 4.5% minimum).

Q9: Capital Required for a Mortgage Portfolio

A bank originates \$500M in residential mortgages (risk weight: 35%). Under the 8% minimum CAR, how much **total regulatory capital** must the bank hold against this portfolio?

- (A) \$14.0M
- (B) \$17.5M
- (C) \$40.0M
- (D) \$175.0M

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Answer: (A) RWA = \$500M $\times$ 35% = \$175M. Required capital = \$175M $\times$ 8% = \$14.0M.

Q10: Expected Loss Calculation

A loan has a Probability of Default (PD) of 3%, Loss Given Default (LGD) of 45%, and Exposure at Default (EAD) of $2M. What is the Expected Loss?

A. $13,500
B. $27,000
C. $60,000
D. $90,000

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Answer: (B) $\text{EL} = \text{PD} \times \text{LGD} \times \text{EAD} = 3\% \times 45\% \times \$2{,}000{,}000 = 0.03 \times 0.45 \times 2{,}000{,}000 = \$27{,}000.$

Q11: LCR Calculation

A bank holds \$60M in Level 1 HQLA and \$20M in Level 2A assets (15% haircut). Its 30-day net cash outflows are \$70M. What is the LCR?

- A 85.7%
- B 100.0%
- C 110.0%
- D 114.3%

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Answer: (C) A 15% haircut means the bank can count 85% of L2A value. Adjusted HQLA = \$60M + (\$20M $\times$ 0.85) = \$60M + \$17M = \$77M. LCR = \$77M / \$70M = 110.0%.

Q12: Impact of Asset Mix on RWA

Bank A holds $1B entirely in government bonds (0% RW). Bank B holds $1B entirely in corporate loans (100% RW). Both have $80M in capital. Which statement is correct?

- A Bank A has a higher CAR than Bank B
- B Bank B has a higher CAR than Bank A
- C Both banks have the same CAR because their total assets are equal
- D Neither bank meets the minimum CAR

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Answer: (A) Bank A: RWA = $0, so CAR is technically infinite (or not applicable — no risk). Bank B: RWA = $1B, CAR = 80/1000 = 8.0%. Bank A's CAR far exceeds Bank B's because government bonds carry zero risk weight.

Q13: Stress Test Interpretation

A bank's CET1 ratio drops from 12% to 5.5% under a supervisory stress test. The minimum CET1 requirement (including buffers) is 7%. What should the bank do?

- A Nothing — the bank still exceeds the 4.5% absolute minimum
- B Raise additional capital, reduce risk, or restrict dividends
- C Immediately liquidate all trading positions
- D Request a government bailout

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Answer: (B) The bank breaches the combined buffer requirement (7%) under stress, even though it stays above the 4.5% hard minimum. The supervisor will require the bank to submit a capital plan: raise equity, reduce RWA, or restrict distributions (dividends, buybacks, bonuses).

Q14: Reverse Stress Test Logic

A bank conducts a **reverse stress test** and finds that a 25% decline in commercial real estate values combined with a 4% GDP contraction would cause insolvency. What is the primary value of this exercise?

- (A) It proves the bank will never fail because the scenario is unlikely
- (B) It identifies the bank's **specific vulnerabilities** and concentration risks
- (C) It replaces the need for regulatory stress tests
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Answer: (B) Reverse stress tests start from failure and work backwards, revealing exactly which concentrations and vulnerabilities could cause the bank to fail. This enables targeted risk reduction before a crisis.

Q15: Operational Risk Measurement Challenge

Why is operational risk considered **harder to model** than credit or market risk?

- (A) Operational events are too frequent to track
- (B) Operational losses are always smaller than credit losses
- (C) Operational events are rare, heterogeneous, and lack reliable statistical distributions
- (D) Operational risk only affects small banks

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Answer: (C) Operational risk events (rogue trading, cyber-attacks, legal settlements) are rare and diverse. Unlike credit defaults, they do not follow well-known statistical distributions, making parametric modeling difficult. A single event can cause catastrophic loss.

Q16: LCR vs. NSFR Complementarity

A bank has an LCR of 130% but an NSFR of only 85%. What does this combination suggest?

- A The bank is perfectly safe from all liquidity risks
- B The bank can survive a 30-day stress but has a structural funding mismatch
- C The bank cannot survive even a mild stress scenario
- D The bank's capital is insufficient

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Answer: (B) The high LCR means sufficient short-term liquid assets for a 30-day stress. But the low NSFR ($<100\%$) indicates the bank relies too heavily on short-term wholesale funding to finance long-term assets — a structural vulnerability that could cause problems beyond 30 days.

Q17: Output Floor Impact

Under Basel III.1, the **output floor** requires that internal-model RWA cannot be less than 72.5% of the standardized approach RWA. Which bank is **most affected**?

- A small bank using only the standardized approach
- A large bank whose internal models produce RWA 60% below the standardized approach
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Answer: (B) The output floor binds when internal models produce significantly lower RWA than the standardized approach. A bank whose models reduce RWA by 60% will be "floored" at 72.5%, meaning its reported RWA will increase substantially, requiring more capital.

Q18: Risk Appetite Trade-offs

A bank's board considers raising the risk appetite to increase return on equity. The CRO warns this will reduce capital buffers. Which framework best structures this decision?

- Compare only the expected return of the riskier strategy vs. the current one
- Use the risk appetite framework: quantify the impact on KRIs, CET1 ratio, and stress test outcomes before deciding
- Adopt the riskier strategy only if competitors have done so
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Answer: (B) The risk appetite framework provides a structured process: the board sets appetite, quantifies the impact on KRIs and capital ratios, evaluates stress test implications, and makes an informed decision. Pure return comparison (A) ignores downside risk.

Q19: Capital Planning Under Stress

After a severe stress test, Bank X has a projected trough CET1 ratio of 4.8% (minimum: 4.5%, with buffer: 7.0%). Bank Y has a trough of 7.2%. Which evaluation is most accurate?

- **A** Both banks pass — they both exceed 4.5%
- **B** Bank X fails and Bank Y passes, because only Bank Y exceeds the combined requirement
- **C** Neither bank passes because both are below 8%
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Answer: (B) The effective requirement includes buffers (7.0%). Bank X at 4.8% breaches the buffer requirement and will face supervisory action (capital plan, distribution restrictions). Bank Y at 7.2% exceeds the combined requirement and passes.

Q20: Holistic Risk Management Evaluation

A bank has strong capital ratios (CET1 = 13%), high LCR (140%), adequate NSFR (110%), but its operational risk KRIs show rising IT incidents, a major cybersecurity breach last quarter, and high staff turnover in the risk function. How should an analyst assess this bank?

- **A** Excellent — the quantitative ratios prove the bank is safe
- **B** Concerning — strong ratios mask deteriorating operational risk controls that could lead to catastrophic losses
- **C** Average — the ratios offset the operational weaknesses perfectly
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Answer: (B) Strong capital and liquidity ratios are necessary but not sufficient. Deteriorating operational risk indicators (IT incidents, breaches, staff turnover) can lead to sudden, severe losses (rogue trading, data breach fines, system outages). A holistic assessment must consider both quantitative ratios and qualitative risk indicators.