2020 FRM Part II

百题巅峰班

流动性和资金风险测量与管理

2020 年 5 月

5. Liquidity and Treasury Risk Measurement and Management

5.1. Liquidity Risk Measurement

5.1.1. 重要知识点

5.1.1.1. Liquidity Risk

- Transaction liquidity risk
- Balance Sheet Risk or Funding Liquidity Risk
- Systemic Risk

5.1.1.2. Liquidity-Adjusted VaR

$$\text{spread} = \frac{(\text{ask price} - \text{bid price})}{(\text{ask price} + \text{bid price})/2}$$

5.1.1.3. Cost of liquidation

$$\text{cost of liquidation} = \sum_{i=1}^{n} \frac{s_i a_i}{2}$$

$$\text{cost of liquidation} = \sum_{i=1}^{n} \frac{(\mu_i + \alpha\sigma_i)a_i}{2}$$

$$\text{LVaR} = \text{VaR} + \text{cost of liquidation}$$

5.1.1.4. $\text{LVaR} = \text{VaR} \times \sqrt{\frac{(1+\text{T})\times(1+2\text{T})}{6\text{T}}}$

- T is the required for the orderly liquidation of a position.

5.1.1.5. Liquidity Coverage Ratio

$$\text{LCR} = \frac{\text{High} - \text{Quality Liquid Assets}}{\text{Net Cash outflows in 30} - \text{day period}} \geq 100\%$$

5.1.1.6. Net Stable Funding Ratio (NSFR)

$$\text{NSFR} = \frac{\text{Amount of Stable Funding}}{\text{Required Amount of Stable Funding}} \geq 100\%$$

5.1.2. 基础题

Q-1. An investor holds two positions:

- Short shares worth $10,000 where the proportional bid-offer spread is 0.030, and
- Long shares worth $17,000 where the proportional bid-offer spread is 0.040

What is the approximate cost to the investor to unwind this two-position portfolio?

A. $490.00

B. $750.00

C. $980.00

D. $1,300.00

Q-2. Which of the following Basel liquidity ratios includes regulatory capital in the numerator?

A. Return on equity (ROE)

B. Net interest income (NII)

C. Liquidity coverage ratio (LCR)

D. Net stable funding ratio (NSFR)

Q-3. Peter's startup company has built a new exchange platform that enables participants to trade derivatives on certain cryptocurrencies. Peter knows that market participants have a strong preference for continuous liquidity, and conversely, participants will avoid a market that suffers a lack of liquidity. Peter is preparing a marketing brochure to promote the new exchange. If his goal is to promote the exchange's well-functioning liquidity features, which of the following feature is most likely to be promoted in the brochure; i.e., which feature contributes to a stable market with respect to liquidity?

A. Stop loss rules

B. Trend trading

C. Liquidity black hole

D. Negative feedback traders

Q-4. Which of the following statements regarding liquidity risk is correct?

A. Asset liquidity risk arises when a financial institution cannot meet payment obligations.

B. Flight to quality is usually reflected in a decrease in the yield spread between corporate and government issues.

C. Yield spread between on-the-run and off-the-run securities mainly captures the liquidity premium, and not the market and credit risk premium.

D. Funding liquidity risk can be managed by setting limits on certain asset markets or

products and by means of diversification.

Q-5. A position with a value of $2.0 million consists of 50,000 shares of stock. The stock is quoted bid $39.00, offer $41.00. The bid-offer spread has a volatility of 2.0%. The stock's daily volatility is 2.00% or 200 basis points. For purposes of value at risk (VaR), assume the stock's arithmetic returns are normally distributed (aka, normal VaR) and the expected daily return rounds to zero (under these assumptions absolute VaR is identical to relative VaR). We want to measure the cost of liquidity under stressed market conditions; aka, we will assume a worstcase volatile spread rather than a static spread. Which is NEAREST to the position's one-day 95.0% confident liquidity-adjusted value at risk (LVaR)? (Please assume a rounded normal deviate of 1.65).

A. $76,300

B. $149,000

C. $318,000

D. $755,000

Q-6. You are a manager of a renowned hedge fund and are analyzing a 1,000 share position in an undervalued but illiquid stock BNA, which has a current stock price of USD 80 (expressed as the midpoint of the current bid-ask spread). Daily return for BNA has an estimated volatility of 1.54%. The average bid-ask spread is USD 0.10. Assuming returns of BNA are normally distributed, what is the estimated liquidity-adjusted daily 95% VaR, under normal market?

A. USD 1,389

B. USD 2,076

C. USD 3,324

D. USD 4,351

Q-7. You are holding 100 SkyTrek Company shares with a current price of $30. The daily mean and volatility of the stock return are 2% and 3%, respectively. VaR should be measured

relative to initial wealth. The bid-ask spread of the stock varies over time, and the daily mean and volatility of this spread are 0.5% and 1%, reactively. The return are normally distributed. What is the daily liquidity-adjusted VaR (LVaR) at a 99% confidence level assuming the confidence parameter of the spread is equal to 2.58?

A. $193.15

B. $172.62

C. $103.50

D. $195.90

Q-8. Dowd defines a ratio of LVaR/VaR. Which of the following should be true about this ratio?

A. It should fall in proportion with the assumed spread

B. It should fall as the confidence level increases

C. It should rise as the holding period increases

D. It should be invariant to assumed spread, confidence level and holding period

5.2. Collateral and Leverage

5.2.1. 重要知识点

5.2.1.1. Maturity Transformation

- Maturity mismatch: borrow at short term to finance investments that require a longer time to become profitable.

5.2.1.2. Liquidity Transformation

- The process by which financial intermediaries use their balance sheets to create assets that can be used as money.
- Market participants hold money to conduct liquidity transactions and for speculative reasons such as risk preferences.
- The demand for money-"liquidity preference", has become particularly pertinent during the subprime crisis.

5.2.1.3. Major forms of collateral market

- Margin loans

- Repurchase agreements
- Securities lending

5.2.1.4. **Leverage effect**: Leverage is important because it provides an opportunity to increase returns to equity investors.

- The leverage effect is the increase in equity returns that results from increasing leverage and is equal to the difference between the returns on the assets and cost of funding.

$$R_e = L \times R_a - (L-1) \times R_d$$

5.2.1.5. **Repurchase agreement**s, or repos, are bilateral contracts where one party sells a security at a specified price with a commitment to buy back the security at a future date at a higher price.

5.2.1.6. Repo refers to the transaction from the borrower's side; that is, from the side that sold the security with a promise to buy it back. When we examine the same transaction from the lender's side, the transaction is referred to as a reverse repurchase agreement.

5.2.1.7. Settlement Calculation

$$\text{Repurchase Price} = \text{Contract Price} \times (1 + \frac{\text{Interest Rate} \times \text{Maturity}}{360})$$

5.2.1.8. General Collateral vs. Special Collateral

5.2.1.9. Large dealer banks are active participants in over-the counter (OTC) derivatives, repo, and securities markets. Their functions in these markets, as well as asset managers and prime brokers, result in a variety of liquidity risks when their solvency is questioned and counterparties reduce their exposure with them.

5.2.1.10. Failure Mechanism:

- Reaction by OTC Derivative counterparties: reduce exposure
- Flight of short-term creditors: repurchase agreements counterparties can raise haircuts
- Flight of prime brokerage clients

5.2.1.11. Loss of cash settlement privileges: clearing bank

5.2.2. 基础题

Q-9. Which of the following is "the risk of moving the price of an asset adversely in the act of buying or selling it" such that this risk is "low if assets can be liquidated or a position can

be covered quickly, cheaply, and without moving the price too much"?

A. Transactions liquidity risk

B. Balance sheet risk

C. Funding liquidity risk

D. Systemic risk

Q-10. About the funding liquidity risk of a fractional-reserve bank, Malz asserts each of the following statements as true EXCEPT which statement is not accurate?

A. Funding liquidity risk arises for market participants who borrow at short term to finance investments that require a longer time to become profitable; the balance-sheet situation of a market participant funding a longer-term asset with a shorter-term liability is called a maturity mismatch.

B. In theory, the core function of a commercial bank is to take deposits and provide commercial and industrial loans to non-financial firms. In doing so, the bank carries out transformations in liquidity, maturity, and credit; it transforms long-term illiquid assets (e.g., loans to businesses) into short-term liquid ones, including deposits and other liabilities that can be used as money.

C. Bank fragility can be mitigated through higher capital (which reduces depositors' concern about solvency, the typical trigger of a bank run), and higher reserves (which reduces concern about liquidity).

D. If a fractional-reserve bank carries out a liquidity and maturity transformation, and has liabilities it is obligated to repay at par and on demand, a properly calibrated asset liability management system can fully immunize (protect) the fractional-reserve bank against a general loss of confidence in its ability to pay out depositors.

Q-11. Suppose a firm with a simple capital structure has assets of $20.0 million and debt of $10.0 million. Return on assets (ROA) is 9.0% and cost of debt is 4.0%, such that the firm's leverage is 2.0 and its return on equity (ROE) is 14.0%. If the firm borrows an additional $6.0 million at the same cost of 4.0%, and asset returns are fixed, what is the firm's new

leverage and return on equity (ROE)?

A. Leverage = 1.7 and ROE = 13.3%.

B. Leverage = 2.0 and ROE = 15.7%.

C. Leverage = 2.3 and ROE = 23.5%.

D. Leverage = 2.6 and ROE = 17.0%.

Q-12. On opening day, Lever Brothers Multistrategy Master Fund LP has the following economic balance sheet: $100 in Cash, $20 in Debt, and Equity of $80. This corresponds to an initial placement of $80 in Equity by the fund's owners plus a loan of $20 by a commercial bank. Assume Lever Brothers finances a long position in $100 worth of an equity at the Reg T margin requirement of 50%. It invests $50 of its own funds and borrows $50 from the broker. Immediately following the trade, its margin account has $50 in equity and a $50 loan from the broker (The broker retains custody of the stock as collateral for the loan). If firm leverage is defined, per Malz, as Assets/Equity, then what is the change in the firm's economic balance sheet?

A. From 1.000 to 1.500.

B. From 1.250 to 1.875.

C. From 1.250 to 1.500.

D. From 1.500 to 1.500.

Q-13. On opening day, Lever Brothers Multistrategy Master Fund LP has the following economic balance sheet: $100 in Cash, $20 in Debt, and Equity of $80. Assume Lever Brothers creates a short position in a stock, borrowing $100 of the security and selling it. It has thus created a liability equal to the value of the borrowed stock, and an asset, equal in value, consisting of the cash proceeds from the short sale. The cash cannot be used to fund other investments, as it is collateral; the broker uses it to ensure that the short stock can be repurchased and returned to the stock lender. It remains in a segregated short account, offset by the value of the borrowed stock. The stock might rise in price, in which case the $100 of proceeds would not suffice to cover its return to the borrower. Lever Brothers must therefore in addition put up margin of $50. After the trade, what is the leverage in the firm's economic balance sheet?

A. 1.25

B. 1.50

C. 1.75

D. 2.50

Q-14. Pasquini Investments (Pasquini) is a private brokerage looking for 30-day financing of $25 million of its accounts payable but is unsure whether the appropriate investment is a term repurchase agreement (repo) or a term reverse repo agreement. Pasquini is willing to post AAA-rated government bonds as collateral. The bonds have a face value of $27 million and a market value of $25 million. The firm is quoted a rate of 0.5% for the transaction. Which of the following choices most accurately reflects the contract type and the repurchase price needed by Pasquini?

	Contract type	Repurchase price
A.	Repo	$27,011,250
B.	Reverse Repo	$25,010,417
C.	Repo	$25,010,417
D.	Reverse Repo	$27,011,250

Q-15. At initiation of a repurchase agreement (repo), counterparty A sells a security to counterparty B for settlement on June 1st, 2015 at an invoice price of USD 180 million. At the same time, counterparty A agrees to repurchase the security three months later, for settlement on September 1st, 2015, at a purchase price equal to the original invoice price plus interest at a repo rate of 0.90%. Using the actual/360 convention of most money market instruments, which is nearest to the repurchase price?

A. $414,000

B. $180,000,000

C. $180,414,000

D. $181,620,000

Q-16. In a presentation to management, a bond trader makes the following statements about repo collateral:

I. Statement 1: The difference between the federal funds rate and the general collateral rate is the special spread.

II. Statement 2: During times of financial crises, the spread between the federal funds rate and the general collateral rate widens.

Which of the trader's statements are accurate?

A. Both statements are incorrect.

B. Only statement 1 is correct.

C. Only statement 2 is correct.

D. Both statements are correct.

Q-17. In contrast to general collateral (GC) repo rates, which of the following is true about special repo rates?

A. Special rates are typically less than general collateral rates.

B. If the counterparty's primary motivation is to lend cash rather than borrow a security, the special rate applies.

C. Special rates are well-suited to repo investors who are looking to obtain the highest rate for the collateral they are willing to accept.

D. The most commonly cited special rates are for overnight repos where any U.S. Treasury collateral is acceptable.

Q-18. In regard to special spreads, each of the following is true EXCEPT which is false?

A. On-the-run (OTR) issues tend to trade "more special" than off-the-run (OFR; i.e., old or double-old) issues, where "more special" refers to special spreads that are larger

B. The special spread equals the general collateral (GC) repo rate minus the special collateral (aka, specifically requested collateral) repo rate

C. On-the-run special spreads peak immediately after an auction, and tend to decrease over the cycle, reaching their lowest level immediately before the next auction

D. Special spreads tend to be volatile on a daily basis (reflecting supply and demand for special collateral) and special spreads can be quite large (e.g., hundreds of basis points)

Q-19. In recent years, large dealer banks financed significant fractions of their assets using short-term, often overnight repurchase (repo) agreements in which creditors held bank securities as collateral against default losses. The table below shows the quarter-end financing of four broker-dealer banks. All values are in USD billions:

	Bank A	Bank B	Bank C	Bank D
Financial instruments owned	823	629	723	382
Pledged as collateral	272	289	380	155

In the event that repo creditors become nervous about a bank's solvency, which bank is least vulnerable to a liquidity crisis?

A. Bank A

B. Bank B

C. Bank C

D. Bank D

Q-20. The classic bank run occurred when depositors became nervous about the solvency of a bank and raced to withdraw their money, which prompted other depositors to take similar action. In recent years, dealer banks have experienced new forms of bank runs which have quickly eroded their liquidity position and ultimately caused their failure. Which of the following describes a key mechanism which leads to the failure of a dealer bank in this modern version of bank run?

A. A large group of a dealer bank's repo creditors simultaneously renew their positions.

B. Many of a dealer bank's prime brokerage clients sell securities in order to increase their cash balance.

C. A significant portion of a dealer bank's over-the-counter derivatives counterparties reduce their exposure to the dealer.

D. The clearing bank of a dealer bank continues making cash payments to the dealer.

Q-21. The Basel Committee recommends that banks use a set of early warning indicators in order to identify emerging risks and potential vulnerabilities in their liquidity position. Which of the following is an early warning indicator of a potential liquidity problem?

A. Credit rating upgrade.

B. Increased asset diversification.

C. Rapid growth in the leverage ratio with significant dependence on short-term repo financing.

D. Positive publicity.

5.3. Liquidity and Reserves Management: Strategies and Policies

5.3.1. 重要知识点

5.3.1.1. Experienced liquidity managers have developed several strategies for dealing with liquidity problems:

- providing liquidity from assets (asset liquidity management)
- relying on borrowed liquidity to meet cash demands (liability management)
- balanced (asset and liability) liquidity management.

5.3.1.2. Four methods to estimating liquidity needs, with each method resting on specific assumptions and yields only an approximation of actual liquidity requirements

- the sources and uses of funds approach

- the structure of funds approach
- the liquidity indicator approach
- the market signals (or discipline) approach

5.3.1.3. Calculating Legal Reserves

- Reserve computation: lagged reserve accounting (LRA)

5.3.2. 基础题

Q-22. Genny Richards is the liquidity manager for Legend Bank. In evaluating the bank's net liquidity position, Richards anticipates the following amounts:

Legend Bank's net liquidity position is closest to:

Line Item	Amount
Asset sales	$1,325,000
Deposit withdrawals	$1,015,000
Dividend payments	$470,000
Incoming deposits	$2,500,000
Loan requests	$845,000
Nondeposit services revenue	$950,000

A. $2,330,000.

B. $2,445,000.

C. $3,385,000.

D. $3,405,000.

Q-23. A bank utilizing the liability management strategy is most likely to use which of the following sources of liquidity?

A. U.S. Treasury securities.

B. Federal agency securities.

C. Repurchase agreement sales.

D. Municipal bond investments.

Q-24. Which of the following indicators would create concern for a liquidity manager looking to stabilize liquidity and create confidence in the bank's position?

A. An increasing hot money ratio.

B. An increasing deposit composition ratio.

C. Increases in reverse repurchase agreements.

D. An excess of federal funds sold over federal funds purchased.

5.4. Liquidity Transfer Pricing: A Guide to Better Practice

5.4.1. 重要知识点

5.4.1.1. To achieve this, LTP

- charges users of funds (assets/ loans) for the cost of liquidity
- credits providers of funds (liabilities/deposits) for the benefit of liquidity.

5.4.1.2. The international survey identified <u>many poor LTP practices</u>, which reflected weaknesses in the LTP methods/approaches that were used to manage funding liquidity risk. These are discussed in more detail below.

- "Zero" Cost of Funds Approach
- Pooled "Average" Cost of Funds Approach
- Matched-Maturity Marginal Cost of Funds Approach

5.4.1.3. Calculating the charge for using, or the credit for providing, funding liquidity about contingent commitments such <u>as lines of credit, collateral postings for derivatives and other financial contracts</u>, is quite difficult.

- In these cases, the best approach is to impose a scenario model
- Banks carry a liquidity cushion, or a " buffer" to help them survive periods of unexpected funding outflows.

5.4.2. 基础题

Q-25. Which of the following is considered a best practice of liquidity transfer pricing (LTP)?

A. A centralized treasury funding center should be implemented to manage the liquidity cushion across business units.

B. Banks should rely on external factors to improve LTP by meeting regulatory authority requirements.

C. Remuneration policies should not be linked to LTP to help incentivize business unit managers to produce longer-term assets.

D. Contingent collateral calls and derivatives should not be included in the LTP process but managed separately to properly account for risks.

Q-26. Which of the following best describes one of the major challenges for banks in implementing an effective LTP process?

A. A decentralized L TP process is recommended to mitigate arbitrage opportunities for

different business units.

B. Illiquid long-term assets should be penalized for increasing liquidity risk.

C. Performance evaluations of business unit managers should be separate from the LTP process.

D. A liquidity management information system (LMIS) should produce and monitor high-quality reports on a quarterly basis.

Q-27. Which of the following statements describes the best approach for liquidity transfer pricing?

A. Zero cost of funds approach is preferred in cases in which swap rates are unknown and undeterminable.

B. The pooled average cost of funds approach is more appropriate for banks with numerous business units.

C. The separate average cost of funds approach is preferred to accurately account for business units with large trading activities.

D. The matched-maturity marginal approach is preferred because it quantifies liquidity risk premiums across all maturities.

Q-28. A bank supplies a line of credit of $10 million that currently has $6 million already drawn. The bank determines that there is a 65% probability the customer will use the remaining line of credit. The bank's cost of funding for the liquidity cushion is 16 bps. If the bank charges contingent commitments based on the probability of a drawdown, what should the charge for liquidity be for this line of credit?

A. $1,664.

B. $2,496.

C. $4,160.

D. $5,850.

5.5. Stress Testing and Contingency Funding Planning

5.5.1. 重要知识点

5.5.1.1. Utilize liquidity for four purposes

- **operational, restricted, contingent, and strategic.**

5.5.1.2. Asset-liability committee (ALCO).

- The ALCO, consistent with its board, management risk committee, and executive management delegated oversight of managing liquidity risk, typically has overall

responsibility for the liquidity stress testing framework.

5.5.1.3. Three lines of defense

- The **treasury** unit, as the first line of defense, typically has ownership of the liquidity stress test modeling process.
- The **independent risk management function**, as the second line of defense, is responsible for providing independent oversight of liquidity.
- **Internal audit**, as the third line of defense, should periodically review the liquidity stress testing framework, procedures, and controls to ensure compliance with policy, regulatory, and control requirements.

5.5.1.4. Institutions use CFPs to address the other end of the spectrum associated with high-impact low-probability events.

- **Liquidity crisis team.** The LCT serves as the central point of contact and is responsible for the continuous monitoring of the institution's liquidity profile. Generally, the LCT is responsible for designing the CFP and submitting it to the senior management group for review and approval.
- **Escalation levels——** three to five escalation levels are common industry practice

5.5.2. 基础题

Q-29. Which type of liquidity is meant specifically to fund capital asset purchases?

A. Contingent.
B. Funding.
C. Restricted.
D. Strategic.

Q-30. Firm A has $1 billion in highly liquid assets. In a sudden stressed scenario, it estimates that retail customers will withdraw $150 million in deposits, and retail customers will be able to make $80 million of loan repayments. Firm A must deal with $60 million of margin and collateral calls on its derivatives transactions due to falling collateral values and greater volatility of the underlying assets. In addition, it has utilized $10 million of a total $100 million liquidity facility. What is the estimate of Firm A's stressed liquidity asset buffer?

A. $0.80 billion.
B. $0.88 billion.
C. $0.90 billion.
D. $0.96 billion.

Q-31. Which liquidity stress impact factor would generally be the largest threat to a bank's liquidity?

A. Deposit run-off.
B. Derivatives cash flows.
C. Loss of secured funding.
D. Loss of wholesale funding.

Q-32. In the context of deposit outflows, which behavioral assessment factor is relevant for individual, small business, and commercial/institutional customers of the bank?

A. Credit usage.
B. FDIC coverage.
C. Industry segment.
D. Relationship tenure.

Q-33. Which of the following statements regarding contingent funding plans (CFPs) is correct?

A. CFPs are linked to liquidity stress tests through their limit structures.
B. CFPs are used for high-severity, high-frequency contingent liquidity events.
C. CFPs allow for a means to control contingent liquidity events in normal times.
D. Liquidity risk measures used during stressed times are a baseline for developing early warning indicators (EWIs) for CFPs.

Q-34. Which of the following items is an example of a contingent action that could be taken by a bank during a stress situation?

A. Securitizing assets.
B. Decreasing lending rates.
C. Increasing capital distributions.
D. Shifting from longer-term to shorter-term funding sources.

5.6. Asset Investment Strategies

5.6.1. 重要知识点

5.6.1.1. Money market instruments

- Which reach maturity within one year and are noted for their low risk and ready marketability

5.6.1.2. Capital market instruments

- Which have remaining maturities beyond one year and are generally noted for their higher expected rate of return and capital gains potential.

5.6.1.3. Five different investment maturity strategies

- No opinion no money
  - The Ladder, or Spaced-Maturity Policy
- Liquidity matters
  - The Front-End Load Maturity Policy
- Return matters
  - The Back-End Load Maturity Policy
- Both liquidity and return matter
  - The Barbell Strategy
- Money and ideas
  - The Rate Expectations Approach

5.6.1.4. Illiquid Assets

- In general, investor should be skeptical of reported returns in illiquid asset markets as they are generally overstated. There are reporting biases that result in artificially inflated returns. The three main biases that impact reported illiquid asset returns are:
  - Survivorship bias.
  - Selection Bias.
  - Infrequent trading.
- There is little evidence that there are large illiquidity risk premiums across asset classes. However, there are large illiquidity risk premiums within asset classes. There are four primary ways that investors can harvest illiquidity premiums:
  - Allocating a portion of the portfolio to illiquid asset classes like real estate. This is passive allocation to illiquid asset classes.
  - Choosing more illiquid assets within an asset class. This means engaging in liquidity security selection.
  - Acting as a market maker for individual securities.
  - Engaging in dynamic factor strategies at the aggregate portfolio level. This means taking long positions in illiquid assets and short positions in liquid assets to harvest the illiquidity risk premium.

5.6.2. 基础题

Q-35. The Acme Investment Firm wants to re-position one of its bond portfolios. Based on its in-house expertise, for the portfolio, it can select from among the following maturity

strategies: Ladder Policy, Front-end Load Maturity Policy, Back-end Load Maturity Policy, Barbell Strategy,or Rate Expectations Approach. The firm's goal for the portfolio is NEITHER to maximize income NOR to seek to maximize the upside potential for earnings. Instead, the goal is to use the portfolio primarily as a source of liquidity. Given that goal, which strategy is BEST?

A. Ladder Policy.

B. Front-end Load Maturity Policy.

C. Back-end Load Maturity Policy.

D. Rate Expectations Approach.

Q-36. Over the next 24 hours, Greenlux State Bank estimates that the following cash inflows and outflows (all figures in millions) will occur:

Deposit withdrawals	$70
Deposit inflows	$100
Scheduled loan repayments	$60
Acceptable loan requests	$90
Borrowing from the money market	$80
Sales of bank assets	$30
Stockholder dividend payments	$20
Revenues from sale of nondeposit services	$10
Repayment of bank borrowing	$50
Operating expenses	$40

What is the bank's projected net liquidity position?

A. -30.0 million

B. +10.0 million

C. +40.0 million

D. +90.0 million

Q-37. Experienced liquidity managers tend to employ one of three strategies: asset liquidity

management (aka, asset conversion), borrowed liquidity (aka, purchased liquidity or liability management), or balanced liquidity management. About these strategies, each of the following statements is true EXCEPT which is false?

A. A liquid asset has a ready market, a reasonably stable price and is reversible.

B. If a bank's primary goal is to avoid shrinking its balance sheet (and weakening the appearance of the balance sheet), then a borrowed liquidity strategy is better than an asset liquidity strategy.

C. If a bank's primary goal is to minimize risk, then a borrowed liquidity strategy is better than an asset liquidity strategy.

D. A balanced liquidity strategy balances the opportunity cost associated with storing liquidity in assets against the risks of interest rate volatility and credit availability associated with borrowing liquidity.

Q-38. First City Bell Bank has forecast its checkable deposits, time and saving deposits, and commercial and household loans over the next six months; aka, semester.

	Deposits		Loans	
Month	**Checkable Deposits**	**Time and Savings Deposits**	**Commercial Loans**	**Consumer loans**
January	120	400	500	140
February	110	490	640	220
March	90	490	700	200
April	80	475	710	175
May	95	475	700	150
June	75	480	720	210

If we employ the sources and uses of funds method to estimate the bank's liquidity needs over the semester, which of the following statements is TRUE?

A. During February, sources of liquidity equal zero.

B. During the first quarter (Jan, Feb, March), Acme expects a positive liquidity gap.

C. Over the cumulative six-month semester (Jan through June), Acme expects a positive liquidity gap.

D. During April, sources of $15 partially offset uses of $25 to imply a negative liquidity gap of ten because $15 - $25 = -$10.

Q-39. Kingstreet Savings is attempting to determine its liquidity requirement. The bank has classified its checking, savings, and nonperson time deposits (which total $380.0 million in deposits) into three categories: hot money, vulnerable, and stable (aka, core) funds:

Millions of dollars	Hot money funds	Vulnerable funds	Stable (core) funds
Checkable deposits	$30.0	$20.0	$30.0
Savings deposits	$10.0	$40.0	$60.0
Nonpersonal time deposits	$70.0	$70.0	$50.0
Percentage reserves	80.00%	50.00%	20.00%
Reserve requirements on checkable deposits			10.00%
Reserve requirements on saving deposits			10.00%

Millions of dollar	
Net transaction deposits	$75.0
Nonpersonal time deposits (<1.5 years)	$100.0
Eurocurrency liabilities	$15.0
Daily average balance in vault cash	$5.0
Reserve requirements:	
Net transaction accounts	
Exemption amount to reserve tranche	6.0%
More than reserve tranche	16.0%
Reserve tranche	$50.0
Exemption amount	$10.0

Nonpersonal deposits	
Less than 18 months	4.0%
18 months or more	0.0%
Eurocurrency liabilities – all types	4.0%

The total liquidity requirement is the sum of the liability and loan requirements, but we are here ignoring the loan liquidity requirement; further, the reserve requirements are not necessarily realistic but instead are rounded for the sake of more convenient calculations. Management has elected to hold an 80.0% reserve in liquid assets or borrowing capacity for each dollar of hot money deposits, a 50.0% reserve behind vulnerable deposits, and a 20.0% reserve for its holdings of core funds. The legal reserve requirement is 10.0% for both checkable and savings deposits; nonpersonal time deposits have zero legal reserve requirements. Kingstreet Savings is using the Structure of Funds approach to estimating its liquidity requirement. What is Kingstreet's net deposit liquidity requirement for the (total of) vulnerable funds?

A. $13.0 million.

B. $30.0 million.

C. $62.0 million.

D. $177.0 million.

Q-40. Below are five of the ten liquidity indicators defined in Rose and Hudgins (the other five are Cash position, Liquid securities, Net federal funds and repurchase agreements position, Deposit brokerage index, and Loan commitments ratio).

- Capacity ratio = Net loans and leases divided by Total assets (-)
- Pledged securities ratio = Pledged securities divided by Total Assets (-)
- Hot money ratio = Money market assets divided by Volatile liabilities (+)
- Core deposit ratio = Core deposits divided by Total assets (+)
- Deposit composition ratio = Demand deposits divided by Time deposits (-)

If the Core deposit ratio unexpectedly dropped, this might be a red flag liquidity indicator. Put another way, the Core deposit ratio is a positive liquidity indicator such that its increase is generally favorable or indicative of a safer situation for the firm with respect to its liquidity needs. Negative liquidity indicators go in the opposite direction: their decrease is favorable while their increase might be cause for concern.

Among the five liquidity indicators listed above, in addition to the Core deposit ratio, which is a POSITIVE liquidity indicator; for which would an unexpected drop maybe be a yellow- or red-flag cause for concern?

A. Capacity ratio
B. Hot money ratio
C. Pledged securities ratio
D. Deposit composition ratio

Q-41. When an investor has difficulty finding a counterparty that does have sufficient funds, this is known as:

A. Agency costs.
B. Selection bias.
C. Market participation costs.
D. Search frictions.

Q-42. You are doing analysis on hedge funds investing, you are curious that one hedge fund who reported returns each year for the last 10 years has stopped reporting. Some of your friends told you that the fund has suffered a big loss this year. This reflects:

A. Infrequent trading bias.
B. Unsmoothing returns.
C. Sample selection bias.
D. Survivorship bias.

Q-43. Which of the following variables is not an illiquidity factor that affects equity returns?

A. On the run/off the run.
B. Trading Frequency.
C. Bid-ask spread.

D. Quote size

Q-44. Regarding of the following strategies to harvest illiquidity premiums, which one is most likely a passive strategy?

A. Choosing the most illiquid assets within an asset class, even if the asset class is generally considered to be liquid.

B. Using dynamic factor strategies at the aggregate portfolio level.

C. Acting as a market maker for individual securities.

D. Allocating a portion of a portfolio to illiquid asset classes.

Q-45. Andrew Ang makes an important, provocative statement when he writes "Reported illiquid asset returns are not returns." He claims that people overstate the expected returns and understate the risk of illiquid assets, and he attributes this to three key biases. According to Ang, each of the following is a bias that overstates the expected returns (and/or understates the risk) of illiquid assets EXCEPT which is not accurate?

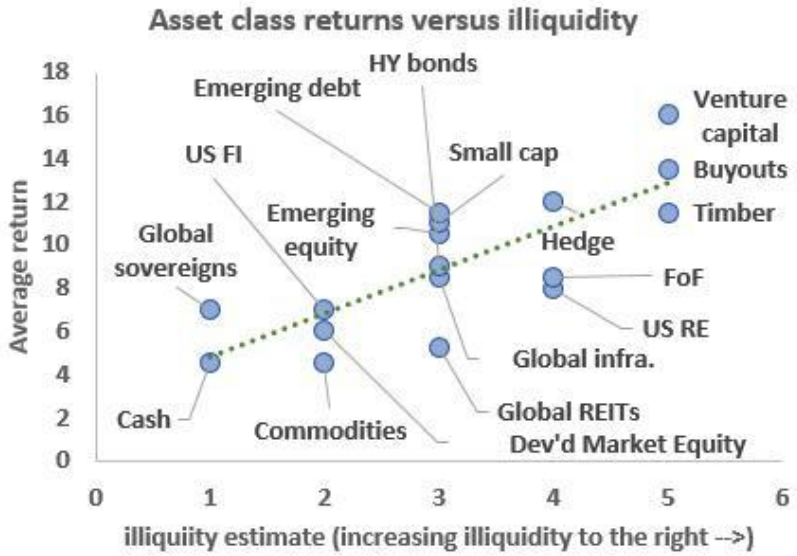
A. Survivorship bias can inflate returns by 4.0% or more

B. Infrequent sampling (aka, infrequent trading) artificially reduces risk and risk-related metrics such as volatility, correlation and beta

C. Turnover bias decreases the typical time between transactions and tends to artificially increase the expected return by 5.0% or more

D. Selection bias (aka, reporting bias) is a distortion of the sample that artificially increases (ie, overestimates) alpha and artificially decreases (ie, underestimates) beta

Q-46. This data is displayed below as a scatterplot where the y-axis is the long-run average return of the asset class and the x-asset is an index of illiquidity. A higher index (ie, to the right) implies less liquidity. For example, the venture capital as an asset class is assigned to the least liquid (most illiquid) asset class but it also plots the highest long-run average return.



In regard to the illiquidity risk premium, which of the following statements it TRUE?

A. In general illiquid asset classes offer high risk-adjusted returns

B. These charts demonstrate that there do exists large illiquidity risk premiums ACROSS asset classes

C. There do exist large illiquidity risk premiums WITHIN many asset classes, but not ACROSS asset classes

D. Illiquid equities earn the same returns as liquid equities; and illiquid bonds earn the same returns as liquid bonds

5.7. Managing Deposit and Nondeposit Services

5.7.1. 重要知识点

5.7.1.1. Different Types of Deposits

- Transaction (Payments or Demand) Deposits
- Nontransaction (Savings or Thrift) Deposits
- Retirement Savings Deposits

5.7.1.2. There are four approaches to price deposit

- cost plus profit margin
- marginal cost
- conditional pricing
- based on total customer relationship and choosing a depository

5.7.1.3. Three broad categories of conditional pricing:

- flat-rate pricing
- free pricing

- conditionally free pricing

5.7.1.4. Various sources of non-deposit liabilities at a bank

- Federal Funds Market ("Fed Funds")
- Repurchase Agreements as a Source of Funds
- Borrowing from Federal Reserve Banks
- Advances from Federal Home Loan Banks
- Development and Sale of Large Negotiable CDs
- The Eurocurrency Deposit Market
- Commercial Paper Market
- Long-Term Nondeposit Funds Sources

5.7.1.5. How much in total must be borrowed from these sources to meet funding needs?

- Available funds gap(AFG)=Current and projected loans and investments the lending institution desires to make - Current and expected deposit inflows and other available funds

5.7.1.6. Which nondeposit sources are best, given the borrowing institution's goals, at any moment in time?

- The relative costs of raising funds from each source.
- The risk (volatility and dependability) of each funding source.
- The length of time (maturity or term) for which funds are needed.
- The size of the institution that requires more funds.
- Regulations limiting the use of alternative funds sources.

5.7.2. 基础题

Q-47. Which of the following deposit accounts will most likely have the highest interest rate?

A. Demand deposit account.
B. Time account (certificate of deposit) with one-year maturity.
C. Money market deposit account (MMDA).
D. Negotiable order of withdrawal (NOW) account.

Q-48. A bank is located near a college campus and would like to attract students to the bank. Which of the following conditional pricing demand deposit accounts would most likely appeal to a college student?

A. A high minimum balance, no item charge/activity fees account.
B. A high minimum balance, high item charge/activity fees account.
C. A low or zero minimum balance account with low- to moderate-item charge/activity fees account.

D. A low or zero minimum balance account with high item charge/activity fees account.

Q-49. A bank currently has $100 million of deposits earning an average rate of 2%. It would like to raise an additional $50 million, but to do so, will have to raise the deposit rate to 3% on both the old and new accounts. What is the marginal cost rate of the additional $50 million in funds?

A. 3%.

B. 5%.

C. 7%.

D. 9%.

Q-50. Which of the following types of nondeposit funding was created to provide liquidity to mortgage lenders?

A. Fed funds.

B. Repurchase agreements.

C. Federal Home Loan Bank (FHLB) borrowing.

D. Discount window borrowing.

Q-51. Barbara Friedman, a bank manager on the asset-liability committee, must estimate the amount of money market funding she expects the bank to need in the coming week. Friedman estimates that the bank will make $60 million of new loans in the coming week. The bank does not plan to make any security investments but does expect additional drawdowns on credit lines to equal $10 million. The bank is in a highly competitive deposit market and only expects $15 million in new deposits in the coming week. However, based on previous years' experience, she expects that two of the bank's largest customers will withdraw $1 million each in the coming week. Friedman should estimate the available funds gap for the coming week to be:

A. $43 million.

B. $45 million.

C. $53 million.

D. $57 million

Q-52. Kris Gaines, Treasurer at Palm Air Bank and Trust, is considering ways to meet a funding gap created by greater than expected loan demand. Palm Air is a medium sized bank located in Florida. The funding gap is approximately $850,000. Gaines is choosing between several nondepository funding types. The funds are needed immediately.

Which type of funding is most appropriate in this situation?

A. Commercial paper.
B. Negotiable certificates of deposit (CDs).
C. Federal funds borrowing.
D. Eurodollar deposits.

5.8. Liquidity Risk Monitoring

5.8.1. 重要知识点

5.8.1.1. Sound Early Warning Indicators (EWI) measures

- One of the critical aspects of a bank's LRM involves first devising and then monitoring a set of indicators to enable the risk identification process to spot the emergence of new or increasing vulnerabilities.

5.8.1.2. Financial Market Utility (FMU): An organization whose purpose is to process and settle payments and securities transactions; these entities are also referred to as Financial Market Infrastructure (FMI) or Value Transfer Networks (VTNs).

5.8.1.3. Measures for Understanding lntraday Flows

- Total payments
- Other cash transactions
- Settlement positions
- Time sensitive obligations
- Total lntraday Credit Lines to Clients and Counterparties
- Total Bank lntraday Credit Lines Available and Usage

5.8.1.4. Measures for Quantifying and Monitoring Risk Levels

- Daily Maximum lntraday Liquidity Usage
- lntraday Credit Relative to Tier 1 Capital
- Client lntraday Credit Usage
- Payment Throughput

5.8.1.5. Liquidity Option

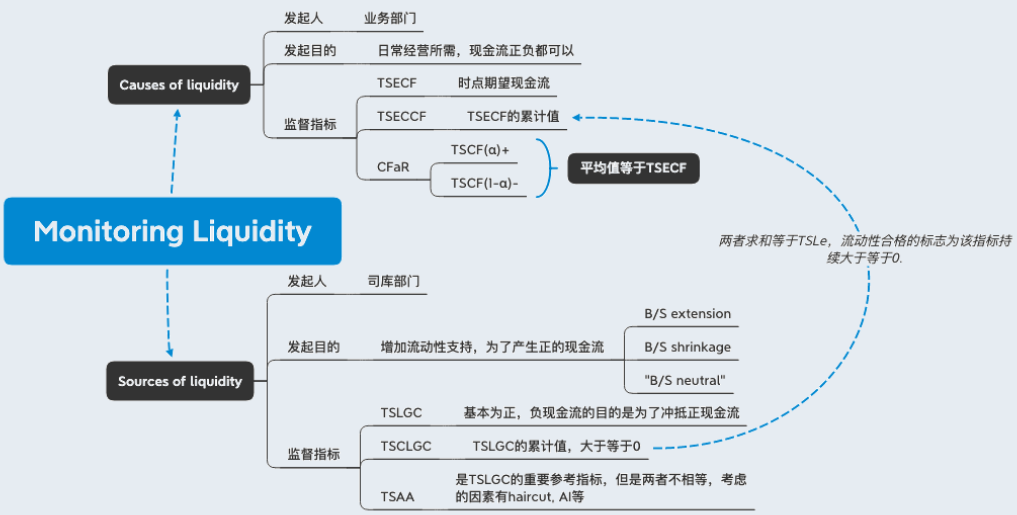
- a liquidity option can be defined as the right of a holder to receive cash from, or to give cash to, the bank at predefined times and terms.

5.8.1.6. The new definition **of Liquidity risk**

- The amount of economic losses due to the fact that on a given date the algebraic sum of positive and negative cash flows and of existing cash available at that date, is different from some (desired) expected level.
  - Inability to raise enough funds to meet payment obligations,

- Ability to raise funds only at costs above those expected.
- Ability to invest excess liquidity only at rates below those expected

5.8.1.7. Liquidity Indicators



5.8.2. 基础题

Q-53. Liquidity Early Warning Indicators (EWI) can be compared to an automobile's dashboard signal system where the appearance of a red light points our attention to something that may become a problem if not addressed. Each of the following is a credible red indicator (aka, red flag) in a Liquidity Early Warning Indicator (aka, Liquidity EWI) dashboard EXCEPT which is not a red (red flag) liquidity indicator?

A. Narrowing debt/CDS spreads.

B. Sudden increase in debt costs.

C. Sudden growth in assets accompanied by volatile liabilities.

D. Rapid decline in the weighted average maturity of liabilities.

Q-54. Venkat explains that firms often use a stoplight system to manage their thresholds: "Firms generally use a stoplight system in representing and communicating their performance against the thresholds of their EWIs. A green indicator means that the measure is within normal bounds. A measure that is classified as amber according to the threshold framework should be investigated further while a red indicator should be a

source for significant concern and may warrant an immediate response." Which of the following is the BEST way to start the exercise of calibration of these thresholds?

A. Thresholds are ultimately subjective.

B. Historical data can inform the calibration of thresholds.

C. Practitioners observe that this stoplight system is obsolete and ineffective such that thresholds are moot.

D. The firm should rely on the specific regulatory instructions, in particular BCBS 2008, for calibration of the thresholds.

Q-55. Which of the following is a USE of intraday liquidity?

A. Income funds flow.

B. Term repo (as the repo seller).

C. Funding of nostro accounts (at correspondent bank outside home market).

D. Intraday credit (Federal Reserve unsecured committed line of credit, LOC).

Q-56. Each of the following is a measure for quantifying and/or monitoring risk levels EXCEPT which is a measure for understanding intraday flows?

A. Total payments.

B. Client intraday credit usage.

C. Intraday credit relative to tier 1 capital.

D. Daily maximum intraday liquidity usage.

Q-57. A new bank treasurer is attempting to obtain a better understanding of the bank's daily cash inflows and outflows. Which of the following transactions is the most significant use of intraday liquidity?

A. Asset purchases/funding.

B. Funding of nostro accounts.

C. Outgoing wire transfers.

D. Settlements at payment, clearing, and settlement (PCS) systems.

Q-58. In the context of characteristics of an effective governance structure in controlling intraday liquidity within a bank, there is emphasis on expertise in which line of defense?

A. Treasury.
B. Internal audit.
C. Information technology.
D. Corporate risk management.

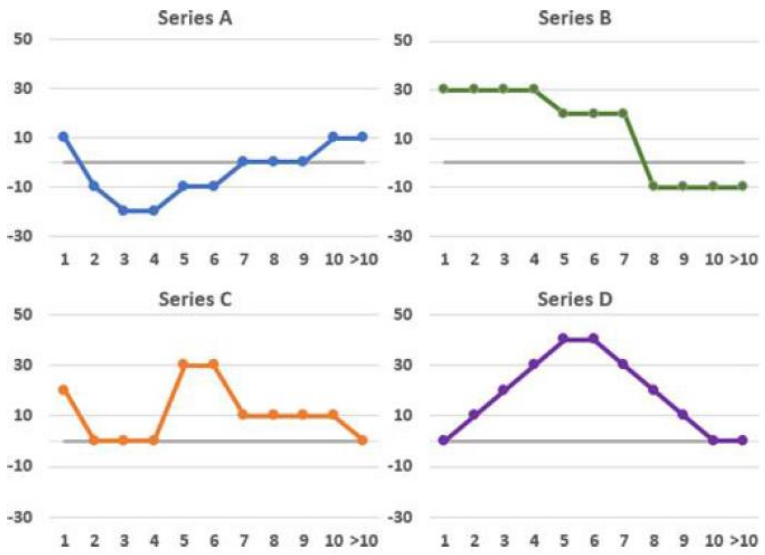
Q-59. Geofinancial Bank currently has the following (very) simplified balance sheet:

Assets		Liabilities	
Bonds	$30.0	Deposits	$30.0
Loans	$70.0	Bonds	$50.0
		Equity	$20.0

Further, the maturities of these accounts are as follows:

- Assets: The bonds ($30.0 million) expire in one year. In regard to the loans ($70.0), $40.0 million expire in five (5) years, $10.0 million expire in seven (7) years, and $20.0 million expire in ten (10) years.
- Liabilities: In regard to the deposits ($20.0 million), $10.0 million expire in one (1) year, and $20.0 million expire in two (2) years. In regard to the bonds ($50.0 million), $10.0 million expire in five (5) years, $30.0 million expire in seven (7) years, and $10.0 million expire in beyond ten (>10) years.
- Equity ($20.0 million) is presumed to expire in ten (10) years.

Which term structure of expected cash flows is accurate for Geofinancial Bank?



A. Series A

B. Series B

C. Series C

D. Series D

Q-60. Which of the following best describes the term structure of expected liquidity, TSL(e)?

A. TLS(e) is the cumulative change in the term structure of available assets (TSAA).

B. TLS(e) is a combination of the term structures of cash flow at risk (CFaR) and liquidity at risk (LaR).

C. TLS(e) is a combination of the term structure of expected cash (TSEC), change in working capital (CIWC), and change in deposits (CID).

D. TLS(e) is a combination of the term structures of cumulative expected cash flows (TSECCF) and liquidity generation capacity (TSCLGC).

Q-61. Consider the following four definitions related to liquidity risk:

- Liquidity risk: The event that in the future the bank receives smaller than expected amounts of cash flows to meet its payment obligations.
- Funding cost risk: The event that in the future the bank has to pay greater than expected cost (spread) above the risk-free rate to receive funds from sources of liquidity that are available.
- Liquidity generation capacity: The ability of a bank to generate positive cash flows, beyond contractual ones, from the sources of liquidity available in the balance sheet

and off the balance sheet at a given date.

- Cash flow at Risk (CFaR): The amount of economic losses due to the fact that on a given date the algebraic sum of positive and negative cash flows and of existing cash available at that date, is different from some (desired) expected level.

About these definitions, which of the following statements is TRUE?

A. Liquidity risk is inaccurate, but the other three are correct
B. Funding cost risk is inaccurate, but the other three are correct
C. Cash risk at Risk (CFaR) is inaccurate, but the other three are correct
D. All four definitions are correct

5.9. Interest Rate Risk and Liquidity Risk

5.9.1. 重要知识点

5.9.1.1. CIP failure and FX swap

- The implicit rate of return in an FX swap is determined by the difference between F and S, and the contract is typically quoted in forward points (F - S).
- Typically, the US dollar has tended to command a premium in FX swaps:

$$\frac{F-S}{S} > \frac{1+r}{1+r^*} - 1$$

5.9.1.2. CIP failure and cross-currency swap

- In a **cross-currency basis swap**, the reference rates are the respective Libor rates plus the basis, b.

$$\mathrm{F} - \mathrm{S} = \mathrm{S}\left(\frac{1+\mathrm{r}+\mathrm{b}}{1+\mathrm{r}^*} - 1\right)$$

5.9.1.3. Limits to Arbitrage: Why the Basis Does Not Close

- Arbitrage become both costly and risky after crisis.
- As a result of tighter management of risks and related balance sheet constraints, arbitrage now incurs a cost per unit of balance sheet.
- This cost is passed on to the pricing of FX swaps, introducing a premium.
- Changes in regulation have reinforced market pressures for a tighter management of balance sheet risks.

5.9.1.4. Causes of the US Dollar shortage during the Great Financial Crisis.

- The funding difficulties which arose during the crisis are directly linked to the remarkable expansion in banks' global balance sheets over the past decade.
- The accumulation of US dollar assets saddled banks with significant funding

requirements, which they scrambled to meet during the crisis.

- Events during the crisis led to severe disruptions in banks' sources of short-term funding. Interbank markets seized up, and dislocations in FX swap markets made it even more expensive to obtain US dollars via swaps.

5.9.1.5. Financial firms use asset-liability strategies to manage two major kinds of interest rate risk

- Price risk
- Reinvestment risk

5.9.1.6. Interest-sensitive Gap Management

- Dollar IS gap = ISA - ISL

5.9.1.7. Duration Gap Management

- **Leverage adjusted duration Gap**=(Dollar-weighted duration of asset Portfolio)-(Dollar-weighted duration of liabilities Portfolio)×(Total liabilities/Total assets)

5.9.2. 基础题

Q-62. Which of the following statements regarding covered interest parity (CIP) is not correct?

A. If CIP does not hold, market participants could make arbitrage profits.

B. The principle of CIP holds that interest rates implied in foreign exchange markets should be consistent with spot short-term interest rates.

C. For currencies A (domestic) and B (foreign), CIP requires only the spot and forward exchange rates for A and B and the money market interest rate on A.

D. CIP states that the forward and spot exchange differential on two currencies should mimic the ratio of money market interest rates on these currencies.

Q-63. The cross-currency swap basis is the:

A. Interest rate differential in a cross-currency swap.

B. Price to the long position in a cross-currency swap.

C. Difference between the forward and spot exchange rates in a cross-currency swap.

D. Amount by which the interest rate of one currency must be adjusted in a cross-currency swap so that covered interest parity (CIP) holds.

Q-64. In an foreign exchange (FX) swap, the:

A. Price is quoted in forward points.

B. Term is typically more than one year.

C. Counterparties swap currencies back at the end of the contract at the original spot rate.

D. Counterparties exchange net interest payments based on the reference rate during the

term of the swap.

Q-65. Since the financial crisis of 2007-2009, the cross-currency basis for most major currencies relative to the U.S. dollar (USD) has consistently been:

A. Equal to zero.

B. Greater than the interest rate differential.

C. Greater than zero for the USD interest rate.

D. Greater than the forward premium on the USD.

Q-66. A bank has a portfolio of short-term bonds. Holding the bank's earning assets and cost of funds constant, in a rising interest rate environment, the bank's:

A. Nll and NIM will remain steady.

B. Nll and NIM will decline.

C. Nll and NIM will increase.

D. Nll will decrease and NIM will increase.

Solution

Q-1. Solution: A

The bid– offer spread for the first holding is 0.040 * 10,000 = $300.00; for the second holding, the bid-offer spread is 0.040 * 17,000= $680.00. Therefore, the cost to unwind the portfolio is (300.00 + 680.00)/2 = $490.00.

Q-2. Solution: D

The NSFR is equal to (Amount of stable funding / required stable funding), and it should exceed 100.0%. As Hull explains about the NSFR, "The numerator is calculated by multiplying each category of funding (capital, wholesale deposits, retail deposits, etc.) by an available stable funding (ASF) factor, reflecting their stability (see Table 16.4). The denominator is calculated from the assets and off-balance-sheet items requiring funding. Each category of these is multiplied by a required stable funding (RSF) factor to reflect the permanence of the funding (see Table 16.5). The implementation date for the NSFR requirement is January 1, 2018."

Therefore, the numerator of the NSFR includes regulatory capital as a stable funding source.

In regard to false (C), the LCR refers to the asset side of the balance sheet: LCR = (high-quality liquid assets; a.ka., HQLA) / (Net cash outflows in a 30-day period), and it should exceed 100.0%

Q-3. Solution: D

Negative feedback traders contribute to a liquid market

In regard to (A), (B) and (C), each may contribute to an illiquid and/or less stable market.

Q-4. Solution: C

The yield spread between on-the-run and off-the-run reflects a liquidity premium.

Because the bonds are otherwise nearly identical. In answers a. and d., asset and funding risk should be interchanged. Finally, for b., a flight to quality increases the yield spread.

Q-5. Solution: B

The one-day 95.0% VaR is given by -0 + 2.00% * 1.65 * 23.0 million = $66,000.

The volatile-spread liquidity cost (LC) in percentage terms is given by 0.5 * (5.0% + 2.0%*1.65) = 4.150%, such that the liquidity cost equals $2.0 million * 4.150% = $83,000.

Therefore, the one-day 95.0% LVaR equals $66,000 + $83,000 = $149,000 (using an exact normal deviate, the answer is $148,691).

Q-6. Solution: B

Under normal market, the LVaR adds half of the bid-ask spread (as a percent) to the VaR calculation:

Daily 95% VaR = 80,000 (1.645 × 0.0154) = USD 2026.64

Liquidity cost (LC) = 80,000 × (0.5 × 0.10/80) = 50

LVaR = VaR + LC = 2076.64

Q-7. Solution: D

LVaR = VaR + LC =30×100× |2%-2.33×3%|+0.5×（0.5%+2.58×1%）×30×100=195.9

Q-8. Solution: B

Dowd: “It is easy to show that the liquidity adjustment (a) rises in proportion with the assumed spread, (b) falls as the confidence level increases, and (c) falls as the holding period increases. The first and third of these are obviously ‘correct’, but the second implication is one that may or may not be compatible with one’s prior expectations.”

Q-9. Solution: A

Transaction liquidity risk is the risk of moving the price of an asset adversely in the act of buying or selling it. Transaction liquidity risk is low if assets can be liquidated or a position can be covered quickly, cheaply, and without moving the price too much. An asset is said to be liquid if it is 'near' or a good substitute for cash. An asset is said to have a liquidity premium if its price is lower and expected return higher because it isn't perfectly liquid. A market is said to be liquid if market participants can put on or unwind positions quickly, without excessive transactions costs and

without excessive price deterioration.

Q-10. Solution: D

Malz (emphasis ours): "No asset-liability management system can protect a fractional reserve bank against a general loss of confidence in its ability to pay out depositors. As long as the bank carries out a liquidity and maturity transformation, and has liabilities it is obligated to repay at par and on demand, no degree of liquidity that a bank can achieve can protect it completely against a run. Fragility can be mitigated through higher capital, which reduces depositors' concern about solvency, the typical trigger of a run, and higher reserves, which reduces concern about liquidity. Historically, banks have also protected themselves against runs through individual mechanisms such as temporary suspension of convertibility, and collective mechanisms such as clearing-houses."

Q-11. Solution: D

Leverage = 2.6 and ROE = 17.0%.

Given new assets of 26.0 and new debt of 16.0, new equity is unchanged at 10.0 = 26.0 - 16.0.

New leverage = 26.0/10.0 = 2.60 and new ROE = (26.0*9% - 16.0*4%)/10.0 = 17.0%.

Q-12. Solution: B

Initial leverage = assets/equity = 100/80 = 1.250.

After the trade, assets = $50 cash + $100 stock = $150;

After the trade, liabilities = $20 debt + $50 margin loan = $70; such that equity = $150-70 = $80; and leverage = 150/80 = 1.875.

Q-13. Solution: D

After the trade, Assets = $200 = $50 cash + $150 Due from broker (i.e., $100 short sale proceeds + $50 margin).

After the trade, Liabilities = $120 = $20 debt + $100 Borrowed Stock, such that Equity =$80 = $200 - $120;

Therefore, Leverage = 200/80 = 2.50.

Q-14. Solution: C

Given that Pasquini is a borrower in the repo market, the transaction is a repo from the perspective of the firm (but a reverse repo from the perspective of the lender). The repurchase price is calculated as follows:

$25,000,000 × (1 + 0.5% × 30/360) = $25,010,417

Q-15. Solution: C

180,000,000 × (1 + 0.0090 × 92/360) = $180,414,000

Q-16. Solution: C

The trader's first statement is incorrect. The difference between the federal funds rate and the general collateral (GC) rate is known as the fed funds-GC spread. The special spread is the difference between the GC rate and the special rate for a particular security.

The trader's second comment is correct. During times of financial crises, the spread between the federal funds rate and the general collateral rate widens as the willingness to lend Treasury securities declines, lowering the GC rate (thereby increasing the spread).

Q-17. Solution: A

Repo trades can be divided into those using general collateral (GC) and those using special collateral or specials. In the former, the lender of cash is willing to take any particular security, although the broad categories of acceptable securities might be specified with some precision. In specials trading, the lender of cash initiates the repo in order to take possession of a particular security.

Q-18. Solution: C

The reverse: On-the-run special spreads are smallest immediately after an auction, and tend to increase over the cycle, reaching their peak immediately before the next auction.

Q-19. Solution: A

A liquidity crisis could materialize if repo creditors become nervous about a banks solvency and choose not to renew their positions. If enough creditors choose not to renew, the bank could likely be unable to raise sufficient cash by other means on such short notice, thereby precipitating a crisis. However, this vulnerability is directly related to the proportion of assets a bank has pledged as collateral.

Bank A is least vulnerable since it has the least dependence on short-term repo financing (i.e. the lowest percentage of its assets out of the four banks is pledged as collateral: 272/823, or 33%.

Q-20. Solution: C

A significant portion of a dealer bank's over-the-counter derivatives counterparties reduce their exposure to the dealer.

Q-21. Solution: C

Rapid asset growth is an early warning of a potential liquidity problem. Positive publicity, credit rating upgrade, and increased asset diversification are all not early warnings of a potential liquidity problem.

Q-22. Solution: B

The net liquidity position is equal to the difference between the supplies of liquidity and the demand for liquidity. Supplies include asset sales ($1,325,000), incoming deposits ($2,500,000), and nondeposit services revenue ($950,000). Demands include deposit withdrawals ($1,015,000), dividend payments ($470,000), and loan requests ($845,000). The net liquidity position is therefore equal to: ($1,325,000 + $2,500,000 + $950,000- ($1,015,000 + $470,000 + $845,000) = $2,445,000.

Q-23. Solution: C

Of the choices given, only repurchase agreement sales (sales of liquid securities) would be a component of a liability (borrowed liquidity) management strategy. U.S. Treasury securities, federal agency securities, and municipal bond investments are all components of an asset liquidity management strategy.

Q-24. Solution: B

The deposit composition ratio compares demand deposits to time deposits. An increasing ratio means that more deposits are demand (relative to time). Demand deposits are more volatile, as they fluctuate based on customer activity. Time deposits are more stable in that they have set maturities and penalties for early withdrawal. Higher demand deposits create a greater liquidity concern. An increasing hot money ratio, increases in reverse repo agreements, and an excess of federal funds sold over federal funds purchased will all improve liquidity positions.

Q-25. Solution: A

A centralized funding center is necessary for proper internal governance of the LTP process.

Wholesale funding should be restricted to a group or subsidiary treasury. Internal factors play an important role in effectively managing the LTP process. Proper LTP processes ensure remuneration policies are effective. LTP process must include contingent collateral calls and derivatives.

Q-26. Solution: B

A major challenge in implementing an effective LTP process is properly accounting for the cost of liquidity in funding illiquid long-term assets and crediting business units that create benefits of liquidity through deposits. Liquidity costs, benefits, and risks should be considered in rewarding manager performance. The LMIS should create monthly reports not quarterly reports. Centralized treasury funding oversight is recommended to reduce business unit arbitrage opportunities.

Q-27. Solution: D

The best practice for LTP is the matched-maturity marginal cost of funds approach. This approach uses the bank's actual market cost of funding to calculate the correct portion to liquidity.

Q-28. Solution: C

The rate charged for the contingent commitment is determined as follows:

Contingent liquidity charge = (remaining balance/credit limit)(probability of drawdown)(liquidity cushion cost of funding)= ($4 million I $10 million)(65o/o)(0.0016)

= 0.000416 or 4.16 bps.

Multiplying this cost times the $10 million credit line amount yields a dollar cost of $4,160.

Q-29. Solution: D

Strategic liquidity comprises the funds that the firm maintains to satisfy potential investment opportunities such as fixed asset purchases or mergers/ acquisitions.

Q-30. Solution: D

The margin and collateral calls on the derivatives transactions are considered stressed outflows. There is $90 million of unused and available liquidity that would also be considered a stressed inflow. The stressed liquidity asset buffer of $0.96 billion is calculated as $1 billion (highly liquid asset) - $150 million (retail deposit outflow) + $80 million (stressed inflow) - $60 million (stressed outflow) + $90 million (stressed inflow).

Q-31. Solution: A

Deposit run-off in the form of depositors withdrawing their demand deposits immediately or suddenly and term depositors withdrawing their investments early (assuming such rights exist) are generally the largest threat to liquidity to banks. Therefore, they are the most important customer behavior to attempt to model.

Q-32. Solution: D

Relationship tenure is a behavioral assessment factor to consider for all three groups of bank customers. Credit usage applies more to small business and commercial/ institutional customers and not individuals. FDIC coverage applies only to individuals and small businesses but not commercial! Institutional customers. Industry segment does not apply to individuals and generally only applies to commercial/ institutional customers.

Q-33. Solution: A

CFPs should be clearly liked to the liquidity stress tests through its limit structure and escalation levels. CFPs are used for high-severity, low-frequency events (not high-frequency events). CFPs allow for a means to control for contingent liquidity events in times of extreme stress (not normal times). Liquidity risk measures used during stressed times (not normal circumstances) are a baseline for developing EWIs.

Q-34. Solution: A

Securitizing assets is a source of cash (increases liquidity) for a bank. Decreasing lending rates encourages the growth of loans issued by the bank, which is an outflow of cash (reduces liquidity) for a bank. The same is true for increasing capital distributions (reduces liquidity). Shifting from shorter-term to longer-term sources of funding is a contingent action, not the other way around.

Q-35. Solution: B

The Front-end Load Maturity Policy purchases short-term securities that mature within a short time interval. Its primary goal is liquidity rather than income or maxim upside.

Q-36. Solution: B

Inflows include:

Deposit inflows = 100 +

Scheduled loan repayments = 60 +

Borrowings from the money market = 80 +

Sales of bank assets = 30 +

Revenues from sale of nondeposit services = 10;

for total inflows of $100 + $60 + $80 + $30 + $10 = 280.0 million.

Outflows include:

Deposit withdrawals = 70 +

Acceptable loan requests = 90 +

Stockholder dividend payments = 20 +

Repayment of bank borrowings = 50 +

Operating expenses = 40;

For total outflows of $70 + $90 + $20 + $50 + $40 = $270.0 million

Therefore, the projected net liquidity position = $280 - 270 = +10.0 million.

Q-37. Solution: C

Instead, if a bank's primary goal is to minimize risk, then an asset liquidity strategy is better than a borrowed liquidity strategy.

Q-38. Solution: D

During April, sources of $15 partially offset uses of $25 to imply a negative liquidity gap of ten because $15 - $25 = -$10.

In regard to (A), (B) and (C), each is FALSE. See solution (image) below.

- In February, Sources equal $80.0 and Uses equal $220.0
- During the first quarter, liquidity gap is negative: -140.0 - 60.0 -10.0 = -$210.0
- During six-month semester, liquidity gap is negative -140.0 - 60.0 - 10.0 + 50.0 - 95.0 = -255.0

The sources and uses of funds approach starts with two facts:

- 1) Liquidity rises as deposits increase and loans decrease
- 2) Liquidity declines when deposits decrease and loans increase

For example:

- February
  - sources = max(0, 80) - min(0, 220) = 80;
    - ✧ i.e., deposits increase by 80.
  - uses = min(0, 80) - max(0, 220) = -220;
    - ✧ i.e., loans increase by 200.
- March

- sources = max(0, -20) - min(0, 40) = 0;
- uses = min(0, -20) - max(0, 40) = -60;
  - ✧ i.e.,deposits decrease by 20 and loans increase by 40.

	Deposits		Loans	
Month	Checkable Deposits	Time and Savings Deposits	Comm'l Loans	Consumer Loans
January	120	400	500	140
February	110	490	640	220
March	90	490	700	200
April	80	475	710	175
May	95	475	700	150
June	75	480	720	210

	Deposits		Loans	
Month	Total	Change from Previous Month	Total	Change from Previous Month
January	520		640	
February	600	80	860	220
March	580	-20	900	40
April	555	-25	885	-15
May	570	15	850	-35
June	555	-15	930	80

Month	Source	Use	Net
January			
February	80	-220	-140
March	0	-60	-60
April	15	-25	-10
May	50	0	50
June	0	-95	-95

Q-39. Solution: C

Because 50.0%* [$20.0*(1 - 0.10) + $40.0*(1 - 0.10) + $70.0] =$62.0 million.

Q-40. Solution: B

The Hot money ratio is a positive liquidity indicator. Hot money ratio = Money market assets divided by Volatile liabilities. It indicates whether the firm has balanced the volatile liabilities with the money market funds it could sell quickly to cover those liabilities. The money market assets comprise cash plus cash due from other depository institutions plus short-term securities plus federal funds loans plus reverse repurchase agreements (repos). The volatile liabilities include large

certificates of deposit (CDs) plus eurocurrency deposits plus federal funds borrowings plus repos. In regard to Capacity ratio (ie, Net loans and leases divided by Total assets); Pledged securities ratio (ie, Pledged securities divided by Total Assets); and Deposit composition ratio (ie, Demand deposits divided by Time deposits), these are negative liquidity indicators.

Q-41. Solution: D

Difficulties finding counterparty are called search frictions. For example, it may be difficult to find someone to understand/purchase a complicated structured credit product. It may also be difficult to find buyers with sufficient capital to purchase multimillion dollar office towers in major metropolitan areas. No matter how high the transaction costs, it may take weeks, months, or years to transact in some situations. Asymmetric information can also be a type of search friction as investors search for non-predatory counterparties with which to transact.

Q-42. Solution: D

There are no requirements for certain types of funds, like private equity funds, to report returns. As such, poorly performing funds have a tendency to stop reporting. Additionally, many poorly performing funds ultimately fail. Performance studies generally include only those funds that were successful enough to survive over the entire period of analysis, leaving out the returns of funds that no longer exist. Both of these factors result in reported returns that are too high. This is called survivorship bias.

Q-43. Solution: A

There are several variables related to illiquidity that are shown to impact equity returns. They are bid-ask spreads, volume, turnover, volume measured by whether the trade was initiated by buyers or sellers, the ratio of absolute returns to dollar volume, the price impact of large trades, informed trading measures (i.e., adverse selection), quote size and depth, the frequency of trades, the number of zero returns, and return autocorrelations. On the run/off the run spread is illiquidity phenomenon you observe in U.S Treasury markets.

Q-44. Solution: D

There are four primary ways that investors can harvest illiquidity premiums:

1. Allocating a portion of the portfolio to illiquid asset classes like real estate (i.e., this is a passive allocation to illiquid asset classes).
2. Choosing more illiquid assets within an asset class (i.e., liquidity security selection).

3. Acting as a market maker for individual securities.
4. Engaging in dynamic factor strategies at the aggregate portfolio level. This means taking long positions in illiquid assets and short positions in liquid assets to harvest the illiquidity risk premium.

Of the four ways investors can harvest illiquidity risk premiums, this is the easiest to implement and can have the greatest effect on portfolio returns.

Q-45. Solution: C

In regard to (A), (B) and (D), each is TRUE.

Ang: "As Faust and Forst note in their memo to Harvard's Council of Deans, the true illiquid asset losses were greater than the reported ones, which leads us to an important corollary.

Reported illiquid asset returns are not returns. Three key biases cause people to overstate expected returns and understate the risk of illiquid assets:

Survivorship bias,

Infrequent sampling, and

Selection bias.

In illiquid asset markets, investors must be highly skeptical of reported returns."

Q-46. Solution: C

There do exist large illiquidity risk premiums WITHIN many asset classes, but not ACROSS asset classes. This is Ang's essential point in section four of Chapter 14: "But while there do not seem to be significant illiquidity risk premiums across classes, there are large illiquidity risk premiums within asset classes."

Q-47. Solution: B

Generally, the longer the maturity of a deposit, the higher the interest rate. This suggests that the time account should have the highest rate of interest. The phrase demand deposit account implies that it is a transaction account, which may be interest bearing or not. NOW accounts are interest-bearing checking accounts, but as they are transaction accounts, they will have a lower interest rate than a time account (certificate of deposit). The MMDA will earn interest, but again, because it allows for some liquidity in terms of check writing, it will likely earn less than the one-year time account.

Q-48. Solution: C

College students generally have less deposits than, for example, the average depositor in an affluent neighborhood. The conditional pricing that would most appeal to students would be a low minimum balance demand deposit account with low- to moderate-item charge and activity fees.

However, this fee structure may be unprofitable for the bank.

Q-49. Solution: B

The marginal cost of the new funds is equal to 5%. The formulas for calculating marginal cost are:

Marginal cost= change in total cost= (new interest rate x total funds raised at new rate) - (old interest rate x total funds raise at the old rate).

Marginal cost rate = change in total cost / additional funds raised.

Marginal cost= (0.03 x $150,000,000) - (0.02 x $100,000,000) = $4,500,000- $2,000,000 = $2,500,000.

Additional interest marginal cost rate = $2,500,000/$50,000,000 = 5.0%.

Q-50. Solution: C

The FHLB system was created in 1932 to make loans to mortgage lenders, at a time when banks were experiencing runs on deposits. The FHLB stabilized the system, allowing banks to continue to make mortgage loans.

Q-51. Solution: D

Available funds gap= current and projected loans and other investments - current and expected deposit inflows and other available funds AFG = ($60 + $10) - ($15 - $2) = $57 million in this case, the bank's expected outflows are twofold, the new loans and the expected drawdowns on credit lines. While the bank expects $15 million of new deposits, Friedman cannot ignore the forecast $2 million being withdrawn by two deposit customers, leaving a net $13 million of deposits. Thus, she expects the bank to need $57 million in nondeposit sources of funding in the coming week.

Q-52. Solution: C

Federal (fed) funds are likely the best funding choice for three reasons. First, because Palm Air Bank and Trust is a medium-sized bank, it may not have access to commercial paper, negotiable CDs, and Eurodollar deposits. Second, these funding sources come in units of $1 million or more. Because the bank needs less than $1 million, commercial paper, negotiable CDs, and Eurodollar deposits are not necessarily appropriate. Third, the funds are needed immediately. Fed funds are available

in smaller denominations and are usually immediately available.

Q-53. Solution: A

Instead, the liquidity EWI is: a widening debt/CDS spreads (consistent with a sudden increase in debt costs). In regard to (B), (C), and (D), each is a candidate Liquidity EWI, per the Study Note: "The Basel Committee on Banking Supervision (BCBS) recommends certain measures as EWI. These measures include [collapsed here, new emphasis ours:

- An unusual growth in assets, particularly when accompanied by volatile liabilities;
- Debt (credit) spreads widen, and/or credit default swap (CDS) spreads widen.
- Declining diversity in the makeup of assets and liabilities; Growing currency mismatches;
- When the weighted average of liabilities' maturity declines;
- Positions going beyond or getting close to regulatory limits;
- Certain product line experience negative trends; The financial condition of the bank weakens; Public press that is negative;
- A downgrade in the credit rating; A decline in the stock price;
- Debt costs increase; Retail and/or wholesale funding costs increase;
- Counterparties becoming nervous about the financial condition of the bank;
- Credit lines are lowered;
- Outflows of retail deposits at an increased pace; Certificates of deposit (CDs) are increasingly redeemed;
- Longer-term funding opportunities become more difficult; and Placing short-term liabilities becomes more difficult".

Q-54. Solution: B

Historical data can inform the calibration of thresholds.

Q-55. Solution: C

Funding of nostro accounts (at correspondent bank outside home market) is a USE of intraday liquidity

In regard to (A), (B) and (D), each is a SOURCE of intraday liquidity.

Q-56. Solution: A

Total payments is a measure for understanding intraday flows.

In regard to (B), (C) and (D), each is a measure for quantifying and/or monitoring risk levels.

Q-57. Solution: C

Outgoing wire payments (either for customers or for the bank itself) are likely the most significant use of intraday liquidity.

Q-58. Solution: D

Ideally, the intraday liquidity risk management framework adopts the standard three lines of defense with emphasis on expertise in the second line of defense, namely corporate risk management. The other two lines of defense are treasury and internal audit. Information technology is not a line of defense, per se.

Q-59. Solution: C

Maturity	Assets	Liabilities	Δ	Net
1	30	10	20	20
2		20	-20	0
5	40	10	30	30
7	10	30	-20	10
10	20	20	0	10
>10		10	-10	0
sum	100	100		

Q-60. Solution: D

The term structure of expected liquidity, TSL (e), is a combination of the term structures of cumulative expected cash flows (TSECCF) and liquidity generation capacity (TSCLGC).

Q-61. Solution: C

Cash risk at Risk (CFaR) is inaccurate but the other three are correct.

The definition given for (C) is a second definition for liquidity risk: The amount of economic losses due to the fact that on a given date the algebraic sum of positive and negative cash flows and of existing cash available at that date, is different from some (desired) expected level.

Q-62. Solution: C

For currencies A and B, CIP uses the spot and forward exchange rates for A and B and the money

market interest rate on both A and B (not just on A), The other statements are all correct. If CIP holds, there are no arbitrage opportunities. If CIP doesn't hold，a market participant could make an arbitrage profit by borrowing money at the lower interest rate, lending money at the higher interest rate, and concurrently fully hedging currency risk.

Q-63. Solution: D

The cross-currency swap basis (b) is the amount by which the interest rate of one currency must be adjusted so that CIP holds. This is shown in the following formula:

$$F - S = S\left(\frac{1 + r + b}{1 + r^*} - 1\right)$$

Q-64. Solution: A

An FX swap is quoted in forward points (F- S). The other choices are features of cross-currency swaps.

Q-65. Solution: C

Since the 2007-2009 crisis, the USD has tended to command a premium relative to the foreign currency (FC) in FX swaps; the party lending USD can sell the FC forward at a price F that is higher than indicated by the interest rate differential. That means the cross-currency swap basis has been greater than zero.

Q-66. Solution: C

The short-term bonds (assets) will reprice while the cost of funds holds steady, increasing Nll and NIM.