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FRM®
Exam Prep

SchweserNotes™

Liquidity and Treasury Risk
Measurement and Management

Part II Book 4

KAPLAN SCHWESER

Book 4: Liquidity and Treasury Risk Measurement and Management

SchweserNotes™ 2026

FRM Part II

KAPLAN  **SCHWESER**

SCHWESERNOTES™ 2026 FRM® PART II BOOK 4: LIQUIDITY AND TREASURY RISK MEASUREMENT AND MANAGEMENT
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Readings and Learning Objectives

STUDY SESSION 10

66. Liquidity Risk

John C. Hull, *Risk Management and Financial Institutions, 5th Edition* (Hoboken, NJ: John Wiley & Sons, 2018). Chapter 24.

After completing this reading, you should be able to:

- explain and calculate liquidity trading risk via cost of liquidation and liquidity-adjusted VaR (LVAR).
- identify examples of liquidity funding risk, funding sources, and lessons learned from real cases: Northern Rock, Ashanti Goldfields, and Metallgesellschaft.
- evaluate Basel III liquidity risk ratios and BIS principles for sound liquidity risk management.
- explain liquidity black holes and identify the causes of positive feedback trading.

67. Liquidity and Leverage

Allan Malz, *Financial Risk Management: Models, History, and Institutions* (Hoboken, NJ: John Wiley & Sons, 2011). Chapter 12.

After completing this reading, you should be able to:

- differentiate between sources of liquidity risk and describe specific challenges faced by different types of financial institutions in managing liquidity risk.
- summarize the asset-liability management process at a fractional reserve bank, including the process of liquidity transformation.
- compare transactions used in the collateral market and explain risks that can arise through collateral market transactions.
- describe the relationship between leverage and a firm's return profile (including the leverage effect), and explain the impact of different types of transactions on a firm's leverage and balance sheet.
- describe and compare methods to measure and manage funding liquidity risk and transactions liquidity risk.
- calculate the expected transactions cost and the spread risk factor for a transaction and calculate the liquidity adjustment to VaR for a position to be liquidated over a number of trading days.
- discuss interactions between different types of liquidity risk and explain how liquidity risk events can increase systemic risk.

68. Early Warning Indicators

Shyam Venkat and Stephen Baird, *Liquidity Risk Management: A Practitioner's Perspective* (Hoboken, NJ: John Wiley & Sons, 2016). Chapter 6.

After completing this reading, you should be able to:

- evaluate the characteristics of sound Early Warning Indicators (EWI) measures.
- identify EWI guidelines from banking regulators and supervisors (OCC, BCBS, Federal Reserve).
- discuss the applications of EWIs in the context of the liquidity risk management process.

69. The Investment Function in Financial-Services Management

Peter Rose and Sylvia Hudgins, *Bank Management & Financial Services, 9th Edition* (New York, NY: McGraw-Hill, 2013). Chapter 10.

After completing this reading, you should be able to:

- compare various money market and capital market instruments and discuss their advantages and disadvantages.
- identify and discuss various factors that affect the choice of investment securities by a bank.
- apply investment maturity strategies and maturity management tools based on the yield curve and duration.

70. Liquidity and Reserves Management: Strategies and Policies

Peter Rose and Sylvia Hudgins, *Bank Management & Financial Services, 9th Edition* (New York, NY: McGraw-Hill, 2013). Chapter 11.

After completing this reading, you should be able to:

- calculate a bank's net liquidity position and explain factors that affect the supply and demand of liquidity at a bank.
- compare strategies that a bank can use to meet demands for additional liquidity.

- c. estimate a bank's liquidity needs through three methods (sources and uses of funds, structure of funds, and liquidity indicators).

71. Intraday Liquidity Risk Management

Shyam Venkat and Stephen Baird, *Liquidity Risk Management: A Practitioner's Perspective* (Hoboken, NJ: John Wiley & Sons, 2016). Chapter 4.

After completing this reading, you should be able to:

- a. identify and explain the uses and sources of intraday liquidity.
- b. discuss the governance structure of intraday liquidity risk management.
- c. differentiate between methods for tracking intraday flows and monitoring risk levels.

72. Monitoring Liquidity

Antonio Castagna and Francesco Fede, *Measuring and Managing Liquidity Risk* (United Kingdom, John Wiley & Sons, 2013). Chapter 6.

After completing this reading, you should be able to:

- a. differentiate between deterministic and stochastic cash flows and provide examples of each.
- b. describe and identify examples of liquidity options and explain the impact of liquidity options on a bank's liquidity position and its liquidity management process.
- c. describe and apply the concepts of liquidity risk, funding cost risk, liquidity generation capacity, expected liquidity, and cash flow at risk.
- d. interpret the term structure of expected cash flows and cumulative cash flows.
- e. discuss the impact of available asset transactions on cash flows and liquidity generation capacity.

STUDY SESSION 11

73. The Failure Mechanics of Dealer Banks

Darrell Duffie, "The Failure Mechanics of Dealer Banks," *Journal of Economic Perspectives* (24:1, pp. 51–72, 2010).

After completing this reading, you should be able to:

- a. compare and contrast the major lines of business in which dealer banks operate and the risk factors they face in each line of business.
- b. identify situations that can cause a liquidity crisis at a dealer bank and explain responses that can mitigate these risks.
- c. assess policy measures that can alleviate firm-specific and systemic risks related to large dealer banks.

74. Liquidity Stress Testing

Shyam Venkat and Stephen Baird, *Liquidity Risk Management: A Practitioner's Perspective* (Hoboken, NJ: John Wiley & Sons, 2016). Chapter 3.

After completing this reading, you should be able to:

- a. differentiate between various types of liquidity, including funding, operational, strategic, contingent, and restricted liquidity.
- b. estimate contingent liquidity via the liquid asset buffer.
- c. discuss liquidity stress test design issues such as scope, scenario development, assumptions, outputs, governance, and integration with other risk models.

75. Liquidity Risk Reporting and Stress Testing

Moorad Choudhry, *The Principles of Banking* (Singapore: John Wiley & Sons, 2012). Chapter 14.

After completing this reading, you should be able to:

- a. describe best practices for the reporting of a bank's liquidity position.
- b. compare and interpret different types of liquidity risk reports.
- c. explain the process of reporting a liquidity stress test and interpret a liquidity stress test report.

76. Contingency Funding Planning

Shyam Venkat and Stephen Baird, *Liquidity Risk Management: A Practitioner's Perspective* (Hoboken, NJ: John Wiley & Sons, 2016). Chapter 7.

After completing this reading, you should be able to:

- a. discuss the relationship between contingency funding planning and liquidity stress testing.
- b. describe best practices in the design of a sound contingency funding plan.
- c. assess the key components of a contingency funding plan (governance and oversight, scenarios and liquidity gap analysis, contingent actions, monitoring and escalation, and data and reporting).

77. Managing Nondeposit Liabilities

Peter Rose and Sylvia Hudgins, *Bank Management & Financial Services, 9th Edition* (New York, NY: McGraw-Hill, 2013). Chapter 13.

After completing this reading, you should be able to:

- distinguish between the various sources of nondeposit liabilities at a bank.
- describe and calculate the available funds gap.
- discuss factors affecting the choice of nondeposit funding sources.
- calculate overall cost of funds using both the historical average cost approach and the pooled-funds approach.

STUDY SESSION 12

78. Repurchase Agreements and Financing

Bruce Tuckman and Angel Serrat, *Fixed Income Securities: Tools for Today's Markets, 3rd Edition* (Hoboken, NJ: John Wiley & Sons, 2011). Chapter 12.

After completing this reading, you should be able to:

- describe the mechanics of repurchase agreements (repos) and calculate the settlement for a repo transaction.
- discuss common motivations for entering into repos, including their use in cash management and liquidity management.
- explain how counterparty risk and liquidity risk can arise through the use of repo transactions.
- assess the role of repo transactions in the collapses of Lehman Brothers and Bear Stearns during the 2007–2009 financial crisis.
- compare the use of general and special collateral in repo transactions.
- identify the characteristics of special spreads and explain the typical behavior of U.S. Treasury special spreads over an auction cycle.
- calculate the financing advantage of a bond trading special when used in a repo transaction.

79. Liquidity Transfer Pricing: A Guide to Better Practice

Joel Grant, "Liquidity Transfer Pricing: A Guide to Better Practice," Occasional Paper, Financial Stability Board, Bank for International Settlements (2011).

After completing this reading, you should be able to:

- discuss the process of liquidity transfer pricing (LTP) and identify best practices for the governance and implementation of an LTP process.
- discuss challenges that may arise for banks during the implementation of LTP.
- compare the various approaches to liquidity transfer pricing (zero cost, average cost, and matched-maturity marginal cost).
- describe the contingent liquidity risk pricing process and calculate the cost of contingent liquidity risk.

80. The US Dollar Shortage in Global Banking and the International Policy Response

Patrick McGuire and Goetz von Peter, "The US Dollar Shortage in Global Banking and the International Policy Response," BIS Working Papers, Bank for International Settlements (2009).

After completing this reading, you should be able to:

- identify the causes of the U.S. dollar shortage during the Great Financial Crisis.
- evaluate the importance of assessing maturity/currency mismatches across the balance sheets of consolidated entities.
- describe the policy response by international central banks to alleviate the U.S. dollar shortage and assess its effectiveness.

81. Covered Interest Parity Lost: Understanding the Cross-Currency Basis

Claudio Borio, Robert McCauley, Patrick McGuire, and Vladyslav Sushko, "Covered Interest Parity Lost: Understanding the Cross-Currency Basis," BIS Quarterly Review, Third Quarter (2016).

After completing this reading, you should be able to:

- differentiate between the mechanics of foreign exchange (FX) swaps and cross-currency swaps.
- identify key factors that affect the cross-currency swap basis.
- assess the causes of covered interest rate parity violations after the financial crisis of 2008.

82. Risk Management for Changing Interest Rates: Asset-Liability Management and Duration Techniques

Peter Rose and Sylvia Hudgins, *Bank Management & Financial Services, 9th Edition* (New York, NY:

McGraw-Hill, 2013). Chapter 7.

After completing this reading, you should be able to:

- a. discuss how asset-liability management strategies can help a bank hedge against interest rate risk.
- b. describe interest-sensitive gap management and apply this strategy to maximize a bank's net interest margin.
- c. describe duration gap management and apply this strategy to protect a bank's net worth.
- d. discuss the limitations of interest-sensitive gap management and duration gap management.

The following is a review of the Liquidity and Treasury Risk Measurement and Management principles designed to address the learning objectives set forth by GARP®. Cross-reference to GARP assigned reading—Hull, Chapter 24.

READING 66

LIQUIDITY RISK

Study Session 10

EXAM FOCUS

Liquidity is extremely important for a financial institution, as it must be able to meet its cash needs as they come due. Candidates should be familiar with the concept of liquidity, the costs of liquidation, and the risks (including value at risk) associated with trading in normal and stressed markets. Also, be familiar with liquidity funding risk, the primary sources of liquidity for a financial institution, and how real firms have been undone by a lack of appropriate liquidity management practices. Basel III introduced key liquidity risk equations, and the Bank for International Settlements (BIS) developed 17 principles associated with liquidity risk management that are critical for the exam. Finally, be familiar with liquidity black holes and how trading strategies, leverage, and regulations can heavily impact liquidity needs.

MODULE 66.1: TRADING LIQUIDITY RISK

LO 66.a: Explain and calculate liquidity trading risk via cost of liquidation and liquidity-adjusted VaR (LVAR).

Although both concepts are often mistaken for one another, solvency and liquidity are very different. **Solvency** exists when equity is positive, implying that assets exceed liabilities on the balance sheet. **Liquidity** relates to a company's ability to meet its obligations as they come due. In terms of trading, liquidity relates to the ease with which an investment can be unwound. Investments in large, publicly traded equity securities are highly liquid, whereas noninvestment grade debt and emerging market equity securities tend to have low liquidity.

For any given asset, its sale price is a function of its estimated value (or mid-market price), the speed with which the sale needs to occur, the quantity being sold, and the overall economic environment. Just as real estate markets can shift from buyer to seller markets, financial assets are vulnerable to economic shifts, which can make all assets more or less liquid depending on the situation.

Large positions are vulnerable to **predatory trading**, which exists when market participants, who are aware of another entity that needs to liquidate a large position, execute similar trades to profit. A pending large transaction to close out a short position would involve large purchases of shares, which other companies can profit from by placing buy orders before the large purchase closeout.

Liquidity requires transparency, and history has shown how investments that lack transparency do not remain liquid for long. In the mid-2000s, portfolios consisting of subprime mortgages and other questionable investments were rampant in the marketplace. Investors lacked an understanding of these investments and the risks involved, and when the credit crisis occurred in 2007, the lack of financial models and information needed to properly value the investments led to significant price declines and an overall lack of liquidity.

For a financial asset with a market maker, there will be both a **bid and offer price**. An asset is sold at the bid price (which is the lower value) and purchased at the offer price (which is the higher value) up to a specified contract size. As the size of the order increases beyond a market maker's size limit, the spread is likely to widen to hedge risk. Even financial assets without market makers have implicit bid-offer spreads.

The dollar bid-offer spread (p) and the proportional bid-offer spread (s) are shown in the following equation, with the **mid-market price** (deemed the fair price) representing the halfway point between the bid and offer.

$$p = \text{offer price} - \text{bid price}$$

$$s = \frac{\text{offer price} - \text{bid price}}{\text{mid-market price}}$$

The cost to execute a trade and liquidate a position is equal to $s \times (a / 2)$, with a as the mid-market or dollar value of the position. The cost to liquidate a book of investments in a normal market, with n representing the number of positions, is equal to:

$$\text{cost of liquidation (normal market)} = \sum_{i=1}^n \frac{s_i \alpha_i}{2}$$

Because larger positions tend to create more liquidity risk due to a widening bid-offer spread, setting size limits to trades, and holding a larger quantity of smaller positions tend to reduce liquidity trading risk.

EXAMPLE: Cost of liquidation

A company has two equity positions. The first is 2 million shares of ABC Company with a bid of \$25.50 and an offer of \$27.00. The second holding is 500,000 shares of XYZ Company with a bid of \$45.00 and an offer of \$46.50.

Calculate the mid-market value of each position, the proportional bid-offer spread, and the cost of liquidation in a normal market.

Answer:

ABC Company:

$$\text{Bid-offer spread} = \$27.00 - \$25.50 = \$1.50$$

$$\text{Mid-market price} = (\$25.50 + \$27.00) / 2 = \$26.25$$

$$\text{Mid-market value: } \$26.25 \times 2 \text{ million shares} = \$52,500,000$$

$$\text{Proportional bid-offer spread: } \$1.50 / \$26.25 = 0.05714$$

XYZ Company:

$$\text{Bid-offer spread} = \$46.50 - \$45.00 = \$1.50$$

Mid-market price = $(\$45.00 + \$46.50) / 2 = \$45.75$

Mid-market value (XYZ): $\$45.75 \times 500,000 \text{ shares} = \$22,875,000$

Proportional bid-offer spread: $\$1.50 / \$45.75 = 0.03279$

Cost of liquidation:

$[(\$52,500,000 \times 0.05714) / 2] + [(\$22,875,000 \times 0.03279) / 2] = \$1,874,961$

While the earlier equation can be used to calculate the cost of liquidation in a normal market, a critical calculation is the cost of liquidation in a stressed market. With μ , σ , and γ representing the mean, standard deviation, and the confidence level of the proportional bid-offer spread, respectively,

$$\text{cost of liquidation (stressed market)} = \sum_{i=1}^n \frac{(\mu_i + \gamma\sigma_i)\alpha_i}{2}$$

EXAMPLE: Cost of liquidation (continued)

Assume the same information as in the previous example. In addition, assume the mean and standard deviation for the bid-offer spread for both securities are \$1.5 and \$2.5, respectively.

Calculate the cost of liquidation at a 95% level of confidence (1.645 z-score for one tail).

Answer:

ABC Company:

Mean, proportional bid-offer spread: $\$1.5 / \$26.25 = 0.05714$

Standard deviation, proportional bid-offer spread: $\$2.5 / \$26.25 = 0.09524$

XYZ Company:

Mean, proportional bid-offer spread: $\$1.5 / \$45.75 = 0.03279$

Standard deviation, proportional bid-offer spread: $\$2.5 / \$45.75 = 0.05464$

Cost of liquidation:

$\{[\$52,500,000 \times (0.05714 + 1.645 \times 0.09524)] / 2\} + \{[\$22,875,000 \times (0.03279 + 1.645 \times 0.05464)] / 2\} = \$7,015,577$

Although the earlier equation assumes a normal distribution for bid-offer spreads, this is not always the reality. However, the equation also assumes a strong positive correlation between investments, which is often the case as a tight liquidity market tends to impact many investments.

Liquidity-adjusted value at risk (LVAR) estimates VaR while taking into account liquidity risk. VaR can be adjusted for the cost of unwinding positions in both normal and stressed markets using the equations derived earlier.

$$\text{liquidity-adjusted VaR (normal market)} = \text{VaR} + \sum_{i=1}^n \frac{s_i \alpha_i}{2}$$

$$\text{liquidity-adjusted VaR (stressed market)} = \text{VaR} + \sum_{i=1}^n \frac{(\mu_i + \gamma \sigma_i) \alpha_i}{2}$$



PROFESSOR'S NOTE

We add the confidence parameter times the volatility of the spread to the mean of the spread since the liquidity adjustment increases the value at risk. Also, notice that the confidence parameter (or z-score) used for the uncertainty of the spread is labeled differently. The confidence parameter in this case is a value to be determined.

Traders are often faced with decisions about the speed at which they unwind their positions. A quick unwind will reduce the risk of the mid-market price moving against them, but increases the risk associated with a widening spread. A slow unwind increases market risk, but decreases the risk associated with widening spreads.

The following equations exist to evaluate the decisions faced by a trader:

$$\text{total costs related to bid-offer spread} = \sum_{i=1}^n q_i \frac{p(q_i)}{2}$$

$$\text{variance of the change in value of the position} = \sum_{i=1}^n \sigma^2 x_i^2$$

$$\text{trader's objective (to minimize VaR)} = \sqrt{\sum_{i=1}^n \sigma^2 x_i^2} + \sum_{i=1}^n q_i \frac{p(q_i)}{2}$$

where:

n = number of days over which to liquidate the position

q = number of units traded in one day

p = bid-offer spread in dollars

x = size of trader's position after one day

i = specific day

An alternative measure of liquidity is the trading volume per day. The higher the volume of trading, the higher the liquidity of the asset. In 2002, an economist named Yakov Amihud proposed a liquidity equation comparing the absolute value of the daily return to the daily dollar volume over a specific time period. Amihud's research showed that expected return was inversely related to liquidity, such that lower liquidity resulted in higher expected returns.¹



MODULE QUIZ 66.1

- Rigues Bank owns 5 million shares of a stock with a bid price of \$10.50 and an offer price of \$12.75. The cost of liquidation in normal market conditions is closest to:
 - \$2.813 million.
 - \$5.625 million.
 - \$6.228 million.

MODULE 66.2: FUNDING LIQUIDITY RISK

LO 66.b: Identify examples of liquidity funding risk, funding sources, and lessons learned from real cases: Northern Rock, Ashanti Goldfields, and Metallgesellschaft.

Liquidity funding risk is a measure of a firm's ability to meet its cash needs as they come due. This risk can stem from weak financial performance, liquidity stresses resulting in hesitant investors, and funding decisions which often result in mismatches where short-term instruments are used to fund longer-term requirements. The ability of a firm to predict when cash is needed is critical, as some cash obligations are very predictable (e.g., coupon payments on bond issuances) and others are harder to forecast (e.g., customer withdrawals).

A financial institution has the following six primary sources of liquidity:

- *Cash and treasuries.* In exchange for relatively low returns, cash holdings and investments in safe instruments like U.S. and UK treasury securities offer significant liquidity. An institution has to balance its investments between those that offer high liquidity and low returns with those that offer lower liquidity but provide a higher return.
- *Retail and wholesale deposits.* Both wholesale and retail deposits tend to be somewhat unstable, as customers can easily transfer funds between financial institutions by comparing interest rates. In addition, tight liquidity environments tend to affect the entire market as opposed to just individual institutions.
- *Trading book liquidation.* In the event that an institution needs to raise cash, it can liquidate a portion of its trading book. The success of this strategy depends on how liquid the book is, especially in stressed (rather than normal) market conditions.
- *Securitization.* The *originate-to-distribute* model led to banks taking illiquid assets and securitizing them (pooling debts owed to an institution and selling their cash flows as securities to investors). The success of this strategy rapidly dissipated in late 2007 because of the subprime mortgage crisis.
- *Borrowing ability.* Stressed market conditions create more risk aversion, which results in higher interest rates and shorter maturities associated with the borrowings. Lines of credit can be set up to help mitigate the risks associated with obtaining funding in stressed market conditions.
- *Central bank borrowings.* In the event a commercial bank needs funding support, the "lenders of last resort" (e.g., the European Central Bank, the Bank of England, and the Federal Reserve in the United States) can be called upon to provide money. The cost is the collateral provided by borrowers, the relatively high interest rate, and the haircut, which reduces the amount lent below the collateral provided. The other challenge is the negative signal that borrowing from a central bank sends to the marketplace, which is why any borrowings from the central bank are kept as quiet as possible.

Case Studies

Northern Rock: A British bank that was heavily involved in mortgage lending. The bank used short-term debt instruments for funding, which became highly problematic when investors were resistant to lend to banks after the subprime mortgage crisis of 2007–2009. In September of that year, Northern Rock went to the Bank of England for funding and

borrowed £3 billion from the Tripartite Authority. Once the BBC broke the news of the emergency request for funding, a massive bank run led to £2 billion in customer withdrawals over the next week. Deposit guarantees by the British government and Bank of England slowed the run, but emergency borrowing continued, reaching £25 billion within six months. The end result was a change in bank management, and the bank itself was nationalized. A more conservative assessment of funding accessibility may have helped mitigate the risk the bank took on before the 2007–2009 financial crisis.

Ashanti Goldfields: A gold mining company in West Africa that sold gold forwards to protect shareholders from potential declines in gold prices. In the fall of 1999, 15 central banks in Europe announced that they would limit gold sales for five years. With a forecasted supply reduction for gold, demand jumped and prices rose over 25%. The short positions in gold forwards led to margin calls that could not be met, as well as significant losses leading to restructuring of hedge positions, the sale of a mine, and equity dilution. While the underlying asset (gold) did increase in value, the illiquidity of the asset itself was misaligned with the immediate need for margin calls to be met in cash.

Metallgesellschaft (MG): A German industrial conglomerate that sold a significant amount of 5- to 10-year fixed-price supply contracts on heating oil and gasoline to customers at above-market prices. The company used long positions in short-term futures contracts to hedge the supply contracts. With oil prices subsequently falling, the futures positions required margin calls that led to a cash drain on the company. Because of management and banker concerns regarding the cash outflows from the positions, the company dropped its fixed-price contracts and closed out its hedge positions, leading to a loss of over \$1.3 billion. Similar to Ashanti Goldfields, immediate cash outflows for margin calls were misaligned with cash inflows from illiquid investments.

Reserve requirements are often put in place, which require banks to maintain a specific percentage of their transaction deposits either in their vaults or with the central bank. While the United States has a reserve requirement of 10%, other countries may have different requirements (e.g., the U.K. has no reserve requirement). The higher the reserve percentage, the bigger the negative impact on the country's money supply.

Liquidity Risk Ratios

LO 66.c: Evaluate Basel III liquidity risk ratios and BIS principles for sound liquidity risk management.

Liquidity risk requirements introduced by Basel III include the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR).

Liquidity coverage ratio (LCR):

$$\frac{\text{high-quality liquid assets}}{\text{net cash outflows in a stressed 30-day period}} \geq 100\%$$

The 30-day period in the LCR represents a period of significant stress which includes a 100% loss of wholesale funding, line of credit drawdowns, a partial loss on deposits, a downgrade of three notches on credit ratings, and higher haircuts on secured funding.

Net stable funding ratio (NSFR):

$$\frac{\text{amount of stable funding}}{\text{required amount of stable funding}} \geq 100\%$$

The amount of stable funding is derived by applying an available stable funding factor to each category of funding. The required amount of stable funding looks at assets and off-balance sheet items that require funding.

The BIS principles, developed as a result of the 2007–2009 liquidity crisis, speak to how banks need to manage liquidity. The 17 principles are described as follows:

Fundamental principle for liquidity risk management and supervision:

- A comprehensive liquidity risk management framework must be in place to maintain a sufficient level of liquidity, which will include enough high quality, unencumbered liquid assets to protect the bank from high stress events. Supervisors are responsible for ensuring that the bank's liquidity position is sufficient and that the framework is adequate and functioning as expected.

Liquidity risk management governance:

- A bank's liquidity risk tolerance should be aligned with its role in the financial system and its business strategy.
- Strategies, policies, and practices developed to manage liquidity risk should be in line with the bank's risk tolerance. Senior management should continuously manage liquidity and report to the bank's board of directors. The board should approve these strategies, policies, and practices at least annually and has responsibility for ensuring that senior management is effectively managing liquidity risk.
- For all significant business activities, liquidity costs, benefits, and risks should be incorporated into the new product approval process, internal pricing, and performance measurement.

Liquidity risk measurement and management:

- A sound framework for projecting cash flows should be included in the overall process for capturing and managing liquidity risk.
- Liquidity risk exposures and funding needs should be controlled and actively monitored across business lines, legal entities, and currencies.
- A bank should effectively diversify its funding sources, maintain strong relationships with its fund providers and the overall funding markets, evaluate its capacity to raise funds quickly, and keep a pulse on the factors which impact its fund raising capacity.
- Under normal and stressed market conditions, a bank should be able to meet settlement and payment obligations based on its management of risks and intraday liquidity positions.
- Active management of collateral positions is required, including the differentiation of encumbered versus unencumbered assets, the physical location where assets are held, and the legal entity that holds the assets.
- Stress tests should be conducted regularly to identify where liquidity strain may exist and to make sure that current liquidity exposures align with established risk tolerances. Outcomes from stress tests should be used to adjust liquidity risk management strategies, policies, and positions.
- A formal contingency funding plan (CFP) should be in place, which articulates how liquidity shortfalls will be met in emergency situations. A regularly tested and updated CFP should

articulate clear responsibilities and outline policies which address managing liquidity in various stress environments.

- A bank should have an identified portfolio of high quality, unencumbered liquid assets that are available without any regulatory, legal, or operational impediments in a range of stressed scenarios.

Disclosure:

- Market participants should be able to assess a bank's liquidity position and the strength of its liquidity risk management framework based on regular, public disclosures.

Supervisory responsibilities:

- Supervisors should comprehensively assess a bank's liquidity position and its liquidity risk management framework.
- Market information, internal reports, and prudential reports should be used by supervisors as supplements to their regular assessments of liquidity positions and the risk management framework.
- Intervention may be needed to address deficiencies in a bank's liquidity position and its risk management processes.
- Regular communication with public authorities and other supervisors is needed, with increased information sharing during stressed market conditions.



MODULE QUIZ 66.2

1. Which of the following statements accurately reflects liquidity management for a financial institution?
 - A. Investments in Treasury securities help a bank increase its risk and return profile.
 - B. Stability in retail deposits over the years has enhanced bank liquidity.
 - C. Central bank borrowings are relatively cheap ways for banks to stay afloat.
 - D. Stressed markets can limit the effectiveness of trading book liquidation strategies.
2. Which of the following factors must be taken into account in the net cash outflows in a 30-day period component of the liquidity coverage ratio (LCR) as required by Basel III?
 - A. Complete losses on deposits.
 - B. Partial losses of wholesale funding.
 - C. Larger haircuts on secured funding.
 - D. Two notch reductions in credit ratings.

MODULE 66.3: LIQUIDITY BLACK HOLES AND POSITIVE FEEDBACK TRADING

LO 66.d: Explain liquidity black holes and identify the causes of positive feedback trading.

Liquidity black holes occur when a market exhibits dried up liquidity because of everyone wanting to take the same side of a transaction (e.g., everyone wants to buy or everyone wants to sell). Also known as a *crowded exit*, a frequent occurrence is when price declines lead to investors wanting to sell. As the sell-off occurs, liquidity disappears and investors are only able to sell at prices far below the assets' implicit values.

Trader behavior drives liquidity in financial markets. Traders are categorized as either **positive feedback traders**, who buy when prices rise and sell when they fall, or **negative feedback traders**, who buy when prices fall and sell when they rise. When a market is