# Solutions for End-of-Chapter Questions and Problems: Chapter Twelve

4.1How does the degree of liquidity risk differ for different types of financial institutions?

* 1. What are the two reasons liquidity risk arises? How does liquidity risk arising from the liability side of the balance sheet differ from liquidity risk arising from the asset side of the balance sheet? What is meant by fire-sale prices?
  2. What are core deposits? What role do core deposits play in predicting the probability distribution of net deposit drains?
  3. The probability distribution of the net deposit drains of a DI has been estimated to have a mean of 2 percent and a standard deviation of 1 percent. Is this DI increasing or decreasing in size? Explain.

4.5. How is the DI's distribution pattern of net deposit drains affected by the following?

a. The holiday season.

b. Summer vacations.

c. A severe economic recession.

d. Double-digit inflation.

4.6. What are two ways a DI can offset the liquidity effects of a net deposit drain of funds? How do the two methods differ? What are the operational benefits and costs of each method?

4.7. What are two ways a DI can offset the effects of asset-side liquidity risk such as the drawing down of a loan commitment?

4.8. A DI with the following balance sheet (in millions) expects a net deposit drain of $15 million.

Assets Liabilities and Equity

Cash $10 Deposits $68

Loans 50 Equity 7

Securities 15

Total assets $75 Total liabilities and equity $75

Show the DI's balance sheet if the following conditions occur:

a. The DI purchases liabilities to offset this expected drain.

b. The stored liquidity management method is used to meet the expected drain.

4.9. AllStarBank has the following balance sheet (in millions):

Assets Liabilities and Equity Cash $30 Deposits $110 Loans 90 Borrowed funds 40

Securities 50 Equity 20 Total assets $170 Total liabilities and equity $170

AllStarBank’s largest customer decides to exercise a $15 million loan commitment. How will the new balance sheet appear if AllStar uses the following liquidity risk strategies?

a. Stored liquidity management.

b. Purchased liquidity management.

4.10. A DI has assets of $10 million consisting of $1 million in cash and $9 million in loans. The DI has core deposits of $6 million, subordinated debt of $2 million, and equity of $2 million. Increases in interest rates are expected to cause a net drain of $2 million in core deposits over the year?

a. The average cost of deposits is 6 percent and the average yield on loans is 8 percent. The DI decides to reduce its loan portfolio to offset this expected decline in deposits. What will be the effect on net interest income and the size of the DI after the implementation of this strategy?

b. If the interest cost of issuing new short-term debt is expected to be 7.5 percent, what would be the effect on net interest income of offsetting the expected deposit drain with an increase in interest-bearing liabilities?

c. What will be the size of the DI after the drain if the DI uses this strategy?

d. What dynamic aspects of DI management would support a strategy of replacing the deposit drain with interest-bearing liabilities?

1. Define each of the following four measures of liquidity risk. Explain how each measure would be implemented and utilized by a DI.

a. Sources and uses of liquidity.

b. Peer group ratio comparisons.

c. Liquidity index.

d. Financing gap and financing requirement.

4.12. A DI has $10 million in T-bills, a $5 million line of credit to borrow in the repo market, and $5 million in excess cash reserves (above reserve requirements) with the Fed. The DI currently has borrowed $6 million in fed funds and $2 million from the Fed’s discount window to meet seasonal demands.

a. What is the DI’s total available (sources of) liquidity?

b. What is the DI’s current total uses of liquidity?

c. What is the net liquidity of the DI?

d. What conclusions can you derive from the result?

4.13. A DI has the following assets in its portfolio: $10 million in cash reserves with the Fed, $25 million in T-bills, and $65 million in mortgage loans. If the DI has to liquidate the assets today, it will receive only $98 per $100 of face value of the T-bills and $90 per $100 of face value of the mortgage loans. Liquidation at the end of one month (closer to maturity) will produce $100 per $100 of face value of the T-bills and $97 per $100 of face value of the mortgage. Calculate the one-month liquidity index for this DI using the above information.

4.14. A DI has the following assets in its portfolio: $20 million in cash reserves with the Fed, $20 million in T-bills, and $50 million in mortgage loans. If the assets need to be liquidated at short notice, the DI will receive only 99 percent of the fair market value of the T-bills and 90 percent of the fair market value of the mortgage loans. Liquidation at the end of one month (closer to maturity) will produce $100 per $100 of face value of the T-bills and the mortgage loans. Calculate the liquidity index using the above information.

4.15. Conglomerate Corporation has acquired Acme Corporation. To help finance the takeover, Conglomerate will liquidate the overfunded portion of Acme’s pension fund. The face values and current and one-year future liquidation values of the assets that will be liquidated are given below:

Liquidation Values

**Asset Face Value t = 0 t = 1 year**IBM stock $10,000 $9,900 $10,500

GE bonds 5,000 4,000 4,500

Treasury securities 15,000 13,000 14,000

Calculate the one-year liquidity index for these securities.

4.16. Plainbank has $10 million in cash and equivalents, $30 million in loans, and $15 in core deposits.

a. Calculate the financing gap.

b. What is the financing requirement?

c. How can the financing gap be used in the day-to-day liquidity management of the bank?

4.17. How can an FI’s liquidity plan help reduce the effects of liquidity shortages? What are the components of a liquidity plan?

4.18. Central Bank has the following balance sheet (in millions of dollars).

Liquidity Run-off

**Assets** level **Liabilities and Equity** factor

Cash $ 20 Level 1 Stable retail deposits $190 3%

Deposits at the Fed 30 Level 1 Less stable retail deposits 70 10

Treasury bonds 145 Level 1 CDs maturing in 6 months 100 0

Qualifying marketable securities 50 Level 1 Unsecured wholesale funding from:

GNMA bonds 60 Level 2A Stable small business deposits 125 5

Loans to AA- corporations 540 Level 2A Less stable small business deposits 100 10

Mortgages 285 Nonfinancial corporates 450 75

Premises 35 Equity 130

Total $1,165 Total $1,165

Cash inflows over the next 30 days from the bank’s performing assets are $7.5 million. Calculate the LCR for Central Bank.

***Applied Case***

**Integrated Mini Case: Measuring Liquidity Risk**

A DI has the following balance sheet (in millions).

Assets Liabilities and Equity

Cash $9 Deposits $75

Loans 95 Purchased funds 40

Securities 26 Equity 15

Total assets $130 Total liabilities and equity $130

The DI’s securities portfolio includes $16 million in T-bills and $10 million in GNMA securities. The DI has a $20 million line of credit to borrow in the repo market and $5 million in excess cash reserves (above reserve requirements) with the Fed. The DI currently has borrowed $22 million in Fed funds and $18 million from the Fed discount window to meet seasonal demands.

1. What is the DI’s total available (sources of) liquidity?

2. What is the DI’s current total uses of liquidity?

3. What is the net liquidity of the DI?

4. Calculate the financing gap.

5. What is the financing requirement?

6. The DI expects a net deposit drain of $20 million. Show the DI's balance sheet if the

following conditions occur:

a. The DI purchases liabilities to offset this expected drain.

b. The stored liquidity management method is used to meet the expected drain (the DI does not want the cash balance to fall below $5 million, and securities can be sold at their fair value).

7. In the event of an unexpected and severe drain on deposits in the next 3 days, and 10 days, the DI will liquidate assets in the following manner:

Liquidation Values ($ millions)

**Asset Fair Value t = 3 days t = 10 days**Cash $ 9 $ 9 $ 9

Treasury bills 16 14 15.5

GNMAs 10 8 9

Loans 95 65 75

Calculate the 3-day and 10-day liquidity index for the DI.