

AFIN8003 Week 9 - Liquidity Risk

Banking and Financial Intermediation

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2024-10-02

Table of contents

| | | |
|----------|--|-----------|
| 1 | Liquidity Risk | 1 |
| 1.1 | Introduction | 1 |
| 1.2 | Causes of liquidity risk | 2 |
| 2 | Liquidity risk at depository institutions | 2 |
| 2.1 | Liability-side liquidity risk | 2 |
| 2.2 | Net deposit drains | 4 |
| 2.3 | Managing net deposit drains | 5 |
| 2.4 | Purchased liquidity management | 5 |
| 2.5 | Stored liquidity management | 6 |
| 2.6 | Asset-side liquidity risk | 7 |
| 2.7 | Asset-side liquidity risk (investment portfolio) | 8 |
| 2.8 | Measuring a DI's liquidity risk exposure | 9 |
| 2.9 | Liquidity risk measures | 10 |
| 2.10 | Liquidity Coverage Ratio (LCR) | 10 |
| 2.11 | Liquidity Coverage Ratio (LCR): example | 11 |
| 2.12 | Net Stable Funding Ratio (NSFR) | 12 |
| 2.13 | Liquidity risk of Australian banks (FY2023) | 12 |
| 2.14 | Liquidity planning | 13 |
| 2.15 | Liquidity risk, unexpected deposit drains, and bank runs | 14 |
| 2.16 | Bank runs, the discount window, and deposit insurance | 14 |
| 3 | Liquidity risk at other types of financial institutions | 14 |
| 3.1 | Life insurance companies | 14 |
| 3.2 | Property-casualty insurers | 14 |
| 4 | Finally... | 15 |
| 4.1 | Suggested readings | 15 |
| | References | 15 |

1 Liquidity Risk

1.1 Introduction

Liquidity risk is a normal aspect of everyday management of a financial institution (FI).

- Depository institutions (DIs) are more exposed to liquidity risk than others
- In extreme cases liquidity risk can threaten the solvency of an FI
- The Global Financial Crisis commencing in 2008 was, in part, due to liquidity risk
- Liquidity risk may result from asset side or liability side

We focus on the risk exposure of DIs.

1.2 Causes of liquidity risk

Liquidity risk can arise on both sides of the balance sheet: the asset side as well as the liability side

- Liability side
 - Depositors and other claim holders decide to cash in their financial claims immediately
 - * The DI has to borrow additional funds or sell assets
 - DI need to be able to predict the distribution of **net deposit drains**
 - * The difference between deposit withdrawals and deposit additions on any specific normal banking day
- Asset side
 - Risk from OBS loan commitments and other credit lines
 - Change of the value of investment securities portfolios due to unexpected changes of interest rates
 - Problems associated with ‘quick’ asset sales/fire-sales
 - * High costs for turning illiquid assets into cash
 - * Low sales price; in worst case, fire-sale price

2 Liquidity risk at depository institutions

2.1 Liability-side liquidity risk

- A DI's balance sheet typically features a large amount of short-term liabilities funding relatively long-term assets.
 - Short-term liabilities: demand deposits, other transaction accounts, etc.
 - Long-term assets: mortgages, C&I loans, etc.
- Demand deposit accounts, money market deposit accounts (MMDAs), and other transaction accounts allow holders to demand immediate repayment of the face value in cash.
 - For example, a DI with 20% of its liabilities in demand deposits, MMDAs, and other transaction accounts must be ready to liquidate assets to cover that amount on any banking day.

i Note

As of June 2021, U.S. commercial banks had total deposits representing 82.19% of total liabilities and capital.

- Cash assets accounted for only 15.45% of total assets.

For CBA, cash and liquid assets account for 9.3% of total assets.

| | Note | Group | | Bank | |
|--|------|------------------|------------------|------------------|------------------|
| | | 30 Jun 23 | 30 Jun 22 | 30 Jun 23 | 30 Jun 22 |
| | | \$M | \$M | \$M | \$M |
| Assets | | | | | |
| Cash and liquid assets | 5.1 | 116,619 | 161,154 | 108,367 | 150,974 |
| Receivables from financial institutions | 5.2 | 6,079 | 6,845 | 5,422 | 6,071 |
| Assets at fair value through Income Statement | 5.3 | 67,627 | 25,315 | 67,641 | 25,249 |
| Derivative assets | 5.4 | 23,945 | 35,736 | 25,585 | 37,774 |
| Investment securities: | | | | | |
| At amortised cost | 5.5 | 2,032 | 3,217 | 2,032 | 3,217 |
| At fair value through Other Comprehensive Income | 5.5 | 84,072 | 79,086 | 77,232 | 72,191 |
| Assets held for sale | 11.3 | 5 | 1,322 | 5 | 28 |
| Loans and other receivables | 3.1 | 926,082 | 878,854 | 816,140 | 773,042 |
| Shares in and loans to controlled entities | 11.2 | – | – | 54,636 | 56,719 |
| Property, plant and equipment | 6.1 | 4,950 | 4,887 | 3,549 | 3,627 |
| Investments in associates and joint ventures | 11.1 | 2,848 | 2,801 | 1,430 | 1,407 |
| Intangible assets | 6.2 | 7,393 | 6,899 | 4,340 | 3,883 |
| Deferred tax assets | 2.5 | 3,811 | 3,173 | 3,640 | 3,069 |
| Other assets | 6.3 | 7,382 | 5,971 | 6,799 | 5,387 |
| Total assets | | 1,252,845 | 1,215,260 | 1,176,818 | 1,142,638 |

Figure 1: Excerpt of CBA's 2023 balance sheet - assets

For CBA, deposits and other public borrowings account for 73.25% of total liabilities.

| | | | | | |
|--|------|------------------|------------------|------------------|------------------|
| Liabilities | | | | | |
| Deposits and other public borrowings | 4.1 | 864,995 | 857,586 | 786,267 | 783,701 |
| Payables to financial institutions | 5.2 | 21,910 | 26,052 | 21,266 | 25,321 |
| Liabilities at fair value through Income Statement | 4.2 | 40,103 | 7,271 | 39,148 | 6,097 |
| Derivative liabilities | 5.4 | 25,347 | 33,899 | 26,728 | 35,002 |
| Due to controlled entities | | – | – | 42,586 | 41,433 |
| Current tax liabilities | | 671 | 263 | 442 | 75 |
| Deferred tax liabilities | 2.5 | 138 | 150 | 64 | 82 |
| Liabilities held for sale | 11.3 | – | 1,183 | – | – |
| Provisions | 7.1 | 3,013 | 3,636 | 2,818 | 3,370 |
| Term funding from central banks | 4.4 | 54,220 | 54,807 | 49,637 | 51,137 |
| Debt issues | 4.3 | 122,267 | 116,902 | 95,893 | 89,940 |
| Bills payable and other liabilities | 7.2 | 15,578 | 12,656 | 14,932 | 12,347 |
| | | 1,148,242 | 1,114,405 | 1,079,781 | 1,048,505 |
| Loan capital | 8.2 | 32,598 | 28,017 | 32,587 | 28,009 |
| Total liabilities | | 1,180,840 | 1,142,422 | 1,112,368 | 1,076,514 |

Figure 2: Excerpt of CBA's 2023 balance sheet - liabilities

💡 It's not that bad.

- Normally, only a small proportion of its deposits will be withdrawn on any given day.
- Further, deposit withdrawals may in part be offset by the inflow of new deposits¹ (and the DI's income).

Most demand deposits are relatively “stable”, acting as consumer **core deposits** on a daily basis.

- **Core deposits** are those deposits that provide a DI with a long-term funding source.

¹Large inflow of deposits may also cause issues if the DI cannot find sufficiently attractive investments.

The DI manager must monitor and predict the *net deposit drains* on any given normal banking day.

- Beyond predictable daily seasonality in deposit flows, other seasonal variations exist.
- Many of these seasonal variations are somewhat predictable.
- Retail DIs often experience above-average deposit outflows around the end of the year and in the summer (due to Christmas and the vacation season).
- Rural DIs may experience a deposit inflow–outflow cycle aligned with the local agricultural cycle.
 - During the planting and growing season, deposits tend to fall.
 - During the harvest season, deposits tend to rise as crops are sold.

2.2 Net deposit drains



Figure 3: A hypothetical distribution of net deposit drains

Consider a probability distribution of net deposit drains that is assumed to be strongly peaked at the 5 percent net deposit withdrawal level, as shown in Figure 3.

- This DI expects approximately 5 percent of its net deposit funds to be withdrawn on any given day with the highest probability.
- A *positive* net drain on deposits, so its new deposit funds and other cash flows are expected to be insufficient to offset deposit withdrawals.

As a result, the liability side of the DI's balance sheet is **contracting**.



Figure 4: Another hypothetical distribution of net deposit drains

Consider another probability distribution of net deposit drains that is assumed to be strongly peaked at the -2 percent net deposit withdrawal level, as shown in Figure 4.

- A *negative* net drain on deposits, so its new deposit funds and other cash flows are expected to be larger than deposit withdrawals.

As a result, this DI is expected to grow with an **expanding** balance sheet.

2.3 Managing net deposit drains

Generally a drain on deposits at DIs can be managed by

- purchased liquidity management
- stored liquidity management

Traditionally, DIs have relied on stored liquidity management. Today, most DIs rely on purchased liquidity management.

i Note

We will discuss in greater detail liquidity management in next week.

2.4 Purchased liquidity management

- A DI manager seeking to *purchase liquidity* turns to markets for purchased funds.
- Options include the cash market and the repurchase agreement markets, which are interbank markets for short-term loans.
- Alternatively, the DI manager could:
 - Issue additional wholesale certificates of deposit.

- Sell notes and bonds.
- Borrowed funds (at market rates) are likely to be at higher rates than interest paid on deposits.

Panel A: Balance sheet immediately before and after deposit drain

| | Assets | Deposits | Borrowed funds | Other liabilities | Total Liabilities |
|-------------------------|--------|----------|----------------|-------------------|-------------------|
| Before the drain | 100 | 70 | 10 | 20 | 100 |
| After the drain | 100 | 65 | 10 | 20 | 95 |

Panel B: Adjusting to a deposit drain through purchased liquidity management

| | Assets | Deposits | Borrowed funds | Other liabilities | Total Liabilities |
|-----------------------------------|--------|----------|----------------|-------------------|-------------------|
| After liquidity management | 100 | 65 | 15 | 20 | 100 |

- Purchased liquidity management allows DIs to maintain their overall balance sheet size
- A liability-side adjustment to the balance sheet to cover a deposit drain

2.5 Stored liquidity management

- A DI manager could also *liquidate* some of its assets, utilizing its stored liquidity.
- Traditionally, U.S. DIs hold cash reserves at the Federal Reserve and in their vaults to meet liquidity needs.
- The Federal Reserve sets minimum reserve requirements for banks' cash reserves.
- Despite these requirements, DIs often hold cash reserves above the minimum to manage liquidity drains.

Note

- In U.S., the Fed reduced the reserve requirement to 0, effective March 26, 2020.
- In Australia, the RBA does not impose formal reserve requirements.

Panel A: Balance sheet immediately before deposit drain

| | Assets | Liabilities | |
|-------------|--------|-------------------|-----|
| Cash | 9 | Deposits | 70 |
| | | Borrowed funds | 10 |
| Other asset | 91 | Other liabilities | 20 |
| Total | 100 | Total | 100 |

Panel B: Adjusting to a deposit drain through stored liquidity management

| | Assets | Liabilities | |
|--------------|--------|-------------------|----|
| Cash | 4 | Deposits | 65 |
| | | Borrowed funds | 10 |
| Other assets | 91 | Other liabilities | 20 |

| | Assets | Liabilities | |
|-------|--------|-------------|----|
| Total | 95 | Total | 95 |

- Size of balance sheet decreases
- DIs tend to prudently hold low-rate excess reserve assets to meet liquidity drains

2.6 Asset-side liquidity risk

This far we have discussed the liability-side liquidity risk due to net deposit drains.

On the asset side, liquidity problems can arise due to

- loan requests
- the exercise by borrowers of their loan commitments and other credit lines! (e.g., at the onset of COVID-19)

See for example Acharya et al. (2024).

Balance Sheet Immediately Before and After Exercise

(a) Before Exercise

| | Amount | | Amount |
|--------------|--------|-------------------|--------|
| Cash | 12 | Deposits | 100 |
| Other assets | 138 | Borrowed funds | 20 |
| | | Other liabilities | 5 |
| | | Equity | 25 |
| Total | 150 | Total | 150 |

(b) After Exercise

| | Amount | | Amount |
|--------------|--------|-------------------|--------|
| Cash | 12 | Deposits | 100 |
| Other assets | 143 | Borrowed funds | 20 |
| | | Other liabilities | 5 |
| | | Equity | 25 |
| Total | 155 | Total | 150 |

Adjusting the Balance Sheet to a Loan Commitment Exercise

(a) Purchased Liquidity Management

| | Amount | | Amount |
|-------------------|--------|-------------------|--------|
| Cash | 12 | Deposits | 100 |
| Other assets | 143 | Borrowed funds | 25 |
| Other liabilities | 5 | Other liabilities | 5 |
| | | Equity | 25 |
| Total | 155 | Total | 155 |

(b) Stored Liquidity Management

| | Amount | | Amount |
|--------------|--------|-------------------|--------|
| Cash | 7 | Deposits | 100 |
| Other assets | 143 | Borrowed funds | 20 |
| | | Other liabilities | 5 |
| | | Equity | 25 |
| Total | 150 | Total | 150 |

2.7 Asset-side liquidity risk (investment portfolio)

Another type of asset-side liquidity risk arises from the investment portfolio.

- Rising interest rates reduce the value of investment portfolios.
- Liquidity in a particular market could deteriorate because no one wants to buy.

Technological development is claimed to have improved the liquidity of financial markets. But given the **herding** behaviour in the market, liquidity could still dry up and investment securities only sold at fire-sale prices.

- The FI must fund the loss in value on the balance sheet such that loan requests and deposit withdrawals can be met.
- The result is increased liquidity risk for the FI.

Balance Sheet Immediately Before and After Drop in Investment Portfolio Value

(a) Before Drop in Value

| | Amount | | Amount |
|----------------------|--------|-------------------|--------|
| Cash | 12 | Deposits | 100 |
| Investment portfolio | 50 | Borrowed funds | 20 |
| Other assets | 88 | Other liabilities | 5 |
| | | Equity | 25 |
| Total | 150 | Total | 150 |

(b) After Drop in Value

| | Amount | | Amount |
|----------------------|--------|-------------------|--------|
| Cash | 12 | Deposits | 100 |
| Investment portfolio | 45 | Borrowed funds | 20 |
| Other assets | 88 | Other liabilities | 5 |
| | | Equity | 20 |
| Total | 145 | Total | 145 |

Adjusting the Balance Sheet for a Drop in Investment Portfolio Value

(a) Purchased Liquidity Management

| | Amount | | Amount |
|----------------------|--------|-------------------|--------|
| Cash | 12 | Deposits | 105 |
| Investment portfolio | 50 | Borrowed funds | 20 |
| Other assets | 88 | Other liabilities | 5 |
| | | Equity | 20 |
| Total | 150 | Total | 150 |

(b) Stored Liquidity Management

| | Amount | | Amount |
|----------------------|--------|-------------------|--------|
| Cash | 7 | Deposits | 100 |
| Investment portfolio | 50 | Borrowed funds | 20 |
| Other assets | 88 | Other liabilities | 5 |
| | | Equity | 20 |
| Total | 145 | Total | 145 |

2.8 Measuring a DI's liquidity risk exposure

1. Financing gap and the financing requirement.

- **Financing gap** is the difference between a DI's average loans and average (core) deposits:

$$\text{Financing gap} = \text{Average loans} - \text{Average deposits}$$

A positive financing gap implies that the DI must fund it using its cash and liquid assets and/or borrowing funds in the money market. Therefore,

$$\text{Financing gap} = -\text{Liquid assets} + \text{Borrowed funds}$$

We thus have the following relationship:

$$\text{Financing gap} + \text{Liquid assets} = \text{Financing requirement (borrowed funds)}$$

2. Peer group ratio comparison

Comparison of certain key ratios and balance sheet features of the DI with similar DIs, for example,

- Loans to deposits
- Loans to assets
- Core deposits to total assets
- (Unused) loan commitments to assets

3. Liquidity index

Developed by Jim Pierce at the Federal Reserve, **liquidity index** measures the potential losses an FI could suffer from a sudden or fire-sale disposal of assets compared with the amount it would receive at a fair market value established under normal market (sale) conditions.

$$I = \sum_{i=1}^N \left(W_i \times \frac{P_i}{P_i^*} \right)$$

where

- W_i is the percentage of each asset in the FI's portfolio
- P_i is the immediate sale price
- P_i^* is the fair market price

The liquidity index should lie between 0 and 1.

2.9 Liquidity risk measures

- During the financial crisis, many DIs struggled to maintain adequate liquidity.
- Central banks had to provide extraordinary levels of liquidity assistance to sustain the financial system.
- Despite this support, some DIs failed or were forced into mergers.
- In response, the BIS's Basel Committee on Banking Supervision introduced two new regulatory standards for liquidity risk supervision:
 - **Liquidity Coverage Ratio (LCR):**
 - * Came into effect on January 1, 2015.
 - * Gradually implemented, reaching full compliance on January 1, 2019.
 - **Net Stable Funding Ratio (NSFR):**
 - * Became a minimum standard on January 1, 2018.
- These rules apply to:
 - Large, internationally active banking organizations with \$250 billion or more in total consolidated assets.
 - Organizations with \$10 billion or more in total on-balance-sheet foreign exposure.
 - Consolidated subsidiary depository institutions with \$10 billion or more in total assets.

2.10 Liquidity Coverage Ratio (LCR)

- The **Liquidity Coverage Ratio (LCR)** is designed to ensure that a DI maintains sufficient **high-quality liquid assets (HQLA)**.
- These HQLA must be easily convertible to cash to meet liquidity needs over a 30-day period.
- The LCR is based on an “acute liquidity stress scenario” defined by supervisors.
 - The scenario includes both institution-specific and systemic shocks.
 - It reflects actual conditions experienced during the global financial crisis.
- The purpose of maintaining the LCR is to ensure that DIs can survive severe liquidity stress for at least 30 days.
- The LCR is reported to DI supervisors on a monthly basis.

$$\text{Minimum LCR} = \frac{\text{Stock of HQLAs}}{\text{Total net cash outflows over next 30 calendar days}} \geq 100\%$$

The stock of HQLAs is defined as follows:

- Liquid assets in the stock must remain liquid in times of stress (i.e., convertible into cash at little loss of value and can be used at the central bank discount window as collateral).
- Liquid assets in the stock must be “unencumbered”, i.e., free of legal, regulatory, contractual, or other restrictions on the ability of the bank to liquidate, sell, transfer, or assign the asset.
- Liquid assets in the stock are divided into level 1 and level 2. Level 1 amount has no cap, and level 2 amount is capped at 40 percent of the stock.
 - Level 1 assets are limited to:
 - * Cash, central bank reserves, marketable securities representing claims on or guaranteed by sovereigns, central banks, public sector entities (PSE), and some supranational institutions (e.g., BIS, IMF, ECB, multilateral development banks).²
 - Level 2A assets (15% haircut):
 - * Eligible marketable securities representing claims on or guaranteed by sovereigns, central banks, PSEs, or multilateral development banks.
 - * Eligible corporate debt securities and covered bonds.
 - Level 2B assets:
 - * Eligible residential mortgage backed securities (25% haircut).
 - * Eligible corporate debt securities and equities (50% haircut).

²There're more restrictions.

The total net cash outflows is defined as:

$$\text{Total net cash outflows over next 30 calendar days} = Out - \min(In, 75\% \times Out)$$

where

- *Out* is total expected cash outflows
- *In* is total expected cash inflows

Cash inflows and outflows are computed based on the type of assets/liabilities and associated draw-down factors.

i Note

For a detailed calculation of cash outflows and inflows, refer to textbook Saunders, Cornett, and Erhemjamts (2023) or to the suggested readings.

2.11 Liquidity Coverage Ratio (LCR): example

Consider the following balance sheet (in million of dollars) of a bank. Calculate the bank's LCR.

- Assume that the cash inflows over the next 30 days from the bank's assets are \$5 million.

| Assets | \$ | Liquidity Level | Liabilities and Equity | \$ | Run-Off Factor |
|-------------------------------|------------|-----------------|---------------------------------------|------------|----------------|
| Cash | 5 | Level 1 | Stable retail deposits | 95 | 3% |
| Deposits at the Fed | 15 | Level 1 | Less Stable retail deposits | 40 | 10 |
| Treasury securities | 100 | Level 1 | Unsecured wholesale funding from: | | |
| GNMA securities | 75 | Level 2A | - Stable small business deposits | 100 | 5 |
| Loans to A-rated corporations | 110 | Level 2A | - Less Stable small business deposits | 80 | 10 |
| Loans to B-rated corporations | 85 | Level 2B | - Nonfinancial corporates | 50 | 75 |
| Premises | 20 | | Equity | 45 | |
| Total | 410 | | Total | 410 | |

The LCR is calculated as follows:

First, calculate the amount of HQLA.

- Level 1 assets is $5 + 15 + 100 = 120$ million

Before adjustment for capps,

- Level 2A assets is $(75 + 110) \times (1 - 15\%) = 157.25$ million³
- Level 2B assets is $85 \times (1 - 50\%) = 42.5$ million⁴

However, Level 2 assets is capped at 40% of HQLA!

- Given that Level 1 assets is 120 million, which should account for at least $1 - 40\% = 60\%$ of HQLA.
- HQLA should be $120 / (1 - 40\%) = 200$ million, which means a maximum of $200 - 120 = 80$ million Level 2 assets.

³There is a 15% haircut applied on the value of Level 2A assets.

⁴There is a 50% haircut applied on the value of Level 2B assets.

- The Level 2 assets after haircut is larger than the cap - they will not further increase HQLA.

Therefore, the HQLA is 200 million.

Next, calculate the total net cash outflows over next 30 days.

Cash outflows are:

- Stable retail deposits: $95 \times 0.03 = 2.85$
- Less stable retail deposits: $40 \times 0.1 = 4$
- Stable small business deposits: $100 \times 0.05 = 5$
- Less stable small business deposits: $80 \times 0.1 = 8$
- Nonfinancial corporates: $50 \times 0.75 = 37.5$

Therefore,

- Total cash outflows over next 30 days is 57.35 million.
- Total cash inflows over next 30 days is 5 million (assumed).
- Total net cash outflows over next 30 days is 52.35 million.

Lastly, calculate LCR:

$$\text{LCR} = \frac{\text{Stock of HQLAs}}{\text{Total net cash outflows over next 30 calendar days}} = \frac{200}{52.35} = 382.04\% \geq 100\%$$

2.12 Net Stable Funding Ratio (NSFR)

- The **Net Stable Funding Ratio (NSFR)** focuses on long-term liquidity management on a DI's balance sheet.
- It evaluates liquidity across the entire balance sheet, encouraging the use of stable sources of financing.
- The NSFR requires a minimum amount of stable funding over a one-year time horizon.
 - It aims to limit the reliance on short-term wholesale funding, a significant issue during the financial crisis.
- The NSFR has been reported to DI supervisors quarterly since 2018.

$$\text{NSFR} = \frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}} \geq 100\%$$

Available stable funding (ASF) includes:

- Bank capital
- Preferred stock with a maturity > 1 year
- Liabilities with maturities > 1 year
- The portion of retail deposits and wholesale deposit expected to stay with bank during a period of idiosyncratic stress

These equity and liabilities are assigned to one of five categories, each with a specific ASF factor.

ASF is calculated as the sum of the weighted amounts.

Required stable funding (RSF) is calculated as the sum of

1. the value of the on-balance-sheet assets multiplied by a specific RSF factor assigned to each particular asset type, and
2. the amount of off-balance-sheet (OBS) activities (or potential liquidity exposure) multiplied by the associated RSF factor.

2.13 Liquidity risk of Australian banks (FY2023)

| | CBA | NAB | ANZ | Westpac |
|--|---------|---------|---------|---------|
| Cash Outflows | | | | |
| Retail And Counterparties Deposits Outflow | 37,416 | 29,947 | 25,517 | 29,304 |
| Stable Deposits | 12,700 | 5,843 | 5,879 | 7,969 |
| Less Stable Deposits | 24,716 | 24,104 | 19,638 | 21,335 |
| Unsecured Wholesale Funding Outflow | 82,444 | 82,299 | 146,698 | 76,953 |
| Operational Deposit Outflow | 22,219 | 21,540 | 22,553 | 18,631 |
| Non Operational Deposits Outflow | 49,236 | 47,619 | 111,549 | 47,073 |
| Unsecured Debt Outflow | 10,989 | 13,140 | 12,596 | 11,249 |
| Secured Wholesale Funding Outflow | 6,839 | 10,701 | 5,405 | 3,891 |
| Additional Outflow Requirements | 26,186 | 38,693 | 70,639 | 30,463 |
| Derivative Expo And Other Collateral Requirement | 7,557 | 8,154 | 48,206 | 12,462 |
| Loss of Funding on Debt Products | 0 | 0 | 0 | 136 |
| Credit And Liquidity Facilities | 18,629 | 30,539 | 22,433 | 17,865 |
| Other Contractual Funding Obligation | 0 | 81 | 0 | 4,515 |
| Other Contingent Funding Obligation | 10,373 | 5,219 | 8,024 | 4,082 |
| Total Cash Outflow | 163,258 | 166,940 | 256,283 | 149,208 |

| | CBA | NAB | ANZ | Westpac |
|---|--------|--------|--------|---------|
| Cash Inflows | | | | |
| Secured Lending | 2,328 | 3,898 | 1,549 | 0 |
| Inflows From Fully Performing Exposures | 9,520 | 11,788 | 17,190 | 5,020 |
| Other Cash Inflows | 6,753 | 1,589 | 36,016 | 7,988 |
| Total Cash Inflow | 18,601 | 17,275 | 54,755 | 13,008 |

| | CBA | NAB | ANZ | Westpac |
|--|---------|---------|---------|---------|
| Liquidity Coverage Ratio (LCR) | | | | |
| Average High Quality Liquid Assets | 189,419 | 209,561 | 267,905 | 181,882 |
| Average Net Cash Outflows | 144,657 | 149,665 | 201,528 | 136,200 |
| Average Liquidity Coverage Ratio | 131.00 | 140.00 | 132.90 | 134.00 |
| Net Stable Funding Ratio (NSFR) | | | | |
| Available Stable Funding | 860,999 | 646,508 | 625,285 | 707,893 |
| Required Stable Funding | 693,453 | 556,016 | 537,430 | 615,341 |
| Net Stable Funding Ratio | 124.00 | 116.00 | 116.35 | 115.00 |

2.14 Liquidity planning

- **Liquidity planning** is crucial for managing liquidity risk and costs, helping with borrowing priorities and minimizing excess reserves.
- Components of a liquidity plan:
 1. Managerial responsibilities: Assign roles during a liquidity crisis and manage public disclosures.
 2. List of fund providers: Identify likely fund withdrawers and patterns, including sensitivity to funding composition changes.
 3. Withdrawal estimates: Assess potential deposit and fund withdrawals over different time horizons and identify funding sources.
 4. Internal limits and asset disposal: Set borrowing limits for subsidiaries and branches, determine acceptable risk premiums, and sequence asset disposals.
- The plan involves key departments like the money desk and Treasury for daily liability funding.

2.15 Liquidity risk, unexpected deposit drains, and bank runs

Major liquidity problems can arise, however, if deposit drains are abnormally large and unexpected, which may occur for a number of reasons, including:

- Concerns about a DI's solvency relative to those of other DIs.
- Failure of a related DI (the contagion effect).
- Sudden changes in investor preferences regarding holding nonbank financial assets (such as T-bills or mutual fund shares) relative to deposits.

In these cases, unexpected deposit drains could trigger a *bank run* that may eventually force a bank into insolvency.

In the worst case, a *bank panic* may occur - systemic or contagious bank run on deposits of banking industry.

2.16 Bank runs, the discount window, and deposit insurance

The two major liquidity risk insulation devices are **deposit insurance** and the **discount window**.

1. Deposit insurance
2. Discount window:
 - A facility provided by central banks where FIs can borrow short-term funds to meet liquidity needs, typically at an interest rate called the “discount rate.”
 - During the March 2023 United States bank failures, banks drew \$153 billion from the discount window as of 15 March 2023, a new record.

Not without economic costs

- Protection may encourage DIs to increase liquidity risk

3 Liquidity risk at other types of financial institutions

3.1 Life insurance companies

- Life insurance companies hold cash reserves and liquid assets to meet policy cancellations (surrenders) and working capital needs.
- Premium income and returns on investments usually cover policyholder surrenders, with government bonds serving as a liquidity buffer.
- If premium income is insufficient, insurers may sell liquid assets to meet demands.
- A loss of confidence in an insurer can lead to a run, with mass policy surrenders forcing asset liquidations at potentially low prices.
- Forced liquidations can push insurers towards insolvency, similar to banks (DIs).

Note

An example is the case of [Equitable Life](#). Increase in surrenders after it received an adverse legal ruling contributed to its failing. Its 256-year history ended in June 2018, after an 18-year-long winding-down process.

3.2 Property-casualty insurers

- Property-casualty (PC) insurers sell policies insuring against certain contingencies impacting either real property or individuals.
- Large unexpected claims may materialize and exceed the flow of premium income and income returns from assets.
 - For example, natural disasters.

4 Finally...

4.1 Suggested readings

- [APRA Explains: Liquidity in banking.](#)
- [RBA: The Implementation of Monetary Policy: Domestic Market Operations.](#)
- [BIS: LCR - Liquidity Coverage Ratio.](#)
- Acharya, V. V., Engle, R., Jager, M., & Steffen, S. (2024). [Why Did Bank Stocks Crash during COVID-19?](#) *The Review of Financial Studies*, 37, 2627–2684.

References

- Acharya, Viral V, Robert Engle, Maximilian Jager, and Sascha Steffen. 2024. “Why Did Bank Stocks Crash During COVID-19?” *The Review of Financial Studies* 37 (9): 2627–84. <https://doi.org/10.1093/rfs/hhae028>.
- Saunders, Anthony, Marcia Millon Cornett, and Otgo Erhemjamts. 2023. *Financial Institutions Management ISE*. 11th ed. McGraw Hill.