A PUBLIC POLICY PRACTICE NOTE

Liquidity Risk

February 2024

Developed by the
Liquidity Work Group
of the ERM/ORSA Committee

American Academy of Actuaries

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Special thanks to the committee responsible for writing the 2000 "Report of the Life Liquidity Work Group," which was used extensively throughout this practice note as many of the discussion points in that paper remain of great use today.

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Any references to current laws, regulations, or practice guidelines are correct as of the date of publication.

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Executive Summary

In 2000, the American Academy of Actuaries (Academy) published a practice note on liquidity risk management with the focus on liquidity in the life insurer context. This 2024 practice note serves as an update to the 2000 practice note. It also extends the perspective from life to include health, and property/casualty practice areas via the addition of practice area-specific appendices.

This report aims to be an educational tool for actuaries, regulators, and other stakeholders, providing information on common liquidity risk management practices. This note is not intended to serve as an actuarial standard of practice (ASOP).

The 2007–2008 financial crisis, the COVID-19 pandemic, and the post-pandemic spike in interest rates have highlighted the importance of liquidity. In response, insurance companies have enhanced their liquidity risk monitoring and refined their liquidity risk management frameworks and policies to reflect heightened expectations from regulators and their own boards of directors. There has also been more centralization of liquidity risk management and collateral management.

Although managing liquidity is a daily function, companies are also exposed to stress liquidity risk, which is focused on sudden, unexpected, or catastrophic risk. It is important to recognize that stress liquidity risk management is distinct from life insurer asset/liability management and capital management issues. It is, therefore, not generally covered by asset adequacy opinions nor is it included in risk-based capital; rather, it is a separate and fundamental area of financial risk management.

This practice note discusses liquidity demands and sources, liquidity risk analysis, and liquidity risk management with a primary focus on preparing for and managing liquidity during events that cause significant unexpected liquidity stress.

Liquidity Risk and Its Causes

What Is Liquidity Risk?

Liquidity is the ability to meet expected and unexpected demands for cash. Liquidity risk is the risk that in current or possible future environments, an entity will not have enough cash or liquid assets to meet its cash obligations or will only be able to obtain sufficient cash at excessive cost.

The most striking example of loss due to this risk is a run-on-the-bank event that causes an institution to fail. A recent example is the 2023 failure of Silicon Valley Bank, when too many customers demanded to have their deposits be paid immediately in cash and that demand exceeded available cash.

Less dramatically, liquidity stress can occur when a company needs to borrow unexpectedly or sell assets at a loss, or when margin or collateral calls reduce sources of liquid assets. Liquidity risk is inherent in the financial services industry. Failure to understand, measure, monitor and manage this risk has led directly to the abrupt collapse of a number of financial services firms.

Types of Liquidity Risk

The liquidity profile of a company is a function of both its assets and liabilities. There are a multitude of ways that internal and external events can create pressure on assets or liabilities that give rise to liquidity risk.

Those drivers of liquidity risk can generally be classified in the following ways:

Invested asset-driven liquidity risks:

- Cash, margin, or collateral calls.
- Expected cash flows not received—defaults, changes in call or prepayment speeds, failure of counterparties to pay money owed.
- Market disruption—inability to transact in the marketplace, temporary shutdown of market, temporary inability to sell assets except at fire-sale prices affecting all assets, or a particular asset class or holding.

Insurance product-driven liquidity risks:

- Increased cash demands from policyholders:
  - Mass policyholder lapses due to a reputation event, contagion from a tangentially related event, or economic drivers.
  - Catastrophic levels of claims requiring near-term payout.
  - Choice of lump-sum payouts instead of annuity payouts.
- Delays in receivables, such as reinsurance recoverables.

- Reduction in anticipated premium volume due to lower-than-expected sales or higher-than-expected lapses.

Interactions between invested asset- and insurance product-driven liquidity risks:

- Significant decline in market value *and* a need to sell the asset for cash rather than hold for maturity.
- Dynamic behaviors of assets and liabilities don't align, creating ALM mismatch where there wasn't before (convexity risk).
- Use of illiquid or duration-mismatched assets.

Corporate activities-driven liquidity risk:

- Limited ability to execute planned transfers of liquid assets between legal entities (fungibility).
  - Board and/or regulatory restrictions on dividends or inter-company borrowing; parent company under stress and not available to backstop.
- Counterparties with downgrade clauses or performance clauses:
  - Margin accounts, collateral requirements, recapture requirements, requirements to post assets in trust, changes in haircuts, higher interest rates.
- Non-insurance liabilities that generate liquidity risk:
    - Insurance entity level (e.g., corporate debt).
    - Non-insurance entities within an insurance group.

Discussion of Invested Asset-Driven Liquidity Risk

Invested asset-driven liquidity risk is a function of assets not providing expected cash flows, assets not being readily convertible into cash, or assets requiring cash to support them (e.g., collateral or margin calls).

Expected cash flows may not be received for a variety of reasons, including defaults, changes in call or prepayment speeds, or the failure of counterparties to pay the money owed by them.

A reduction in asset liquidity could be due to a temporary inability to sell assets except at fire-sale prices affecting either all assets or a particular asset class or holding. Assets may not be able to be translated into cash because of a market disruption, such as a temporary shutdown of the market. Alternatively, over-concentration of less-liquid assets such as real estate or thinly traded securities may make it difficult to transact an asset without significant losses. Lack of diversification in the asset portfolio due to over-concentration in an industry or creditor may create a liquidity crunch.

Hedging introduces another potential source of liquidity risk. Margin requirements, including whether margin must be posted in cash or whether eligible securities may be used, can drive very material liquidity needs. The required amount for collateral is typically evaluated regularly, often

daily, through a mark-to-market process. For over-the-counter (OTC) derivatives, depending on the market value of the derivatives, there can be net positive or negative collateral. The amount of collateral required can increase or decrease rapidly.

A subset of asset-driven liquidity risk is when the assets an insurer intends to use for liquidity have their own liquidity risk. For example:

- Securities lending programs and repurchase agreements, frequently referred to as repos, require encumbering what are typically some of the more liquid securities on an insurer's balance sheet. It is important to recognize that assets posted as collateral under these agreements are rendered unavailable for sale in a stress liquidity scenario as long as they continue serving as collateral.
- It may not be possible to renew a credit facility in a stress situation.
- An internal line of credit may be in place from an insurer's parent, but if the liquidity crisis is brought about because of problems with the parent it may then be unable to honor the line.
- When liquidity risk is defined as the inability to gain sufficient cash without excessive loss, a significant change in the market value of assets may reduce a company's liquidity, even if the assets themselves remain liquid and easily sold. The abrupt spike in interest rates in 2022 created this situation for many financial institutions, where even very liquid U.S. Treasury holdings couldn't be sold without realizing significant statutory losses due to the rate increases causing the market value of those assets to fall well below their book value.

As a final comment on asset-driven liquidity risk, accounting regimes also affect recognition of losses and the ability to liquidate securities, even those with liquid markets. Securities designated held-for-trading under U.S. GAAP have their values "marked-to-market," so losses are recognized immediately through income. Selling them does not create further accounting losses unless the sales are large enough that they affect market prices. Securities designated available-for-sale have changes in market value recognized through "other comprehensive income" (OCI), deferring effects on reported income but affecting capital immediately. Securities held at amortized cost ("book value"), such as those designated held-to-maturity (HTM) under U.S. GAAP, may avoid loss recognition if selling prior to their maturity date can be avoided.

However, if some securities designated held-to-maturity must be sold, the ability and intent of management to hold the remaining held-to-maturity portfolio may be called into question. In this case, the entire held-to-maturity portfolio may be considered "tainted" and reclassified to available-for-sale, immediately recognizing unrealized losses in the entire HTM portfolio. With minor exceptions, this accounting rule regarding HTM securities limits the practical liquidity of otherwise liquid securities. As a result, insurers typically limit the proportion of their portfolio classified as HTM.

Under U.S. statutory accounting, most fixed income investments are held at amortized cost.

Discussion of Insurance Product-Driven Liquidity Risk

Insurance product-driven liquidity risk could be related to a decrease in sales or an increase in benefit payments or related expenses and commissions. It could also be due to a counterparty, such as a reinsurer, not fulfilling its obligations. Most life insurance companies are also exposed to "call risk" in the form of surrender values they could be required to pay out on demand from their policyholders.

There are many reasons benefit payments to policyholders could increase:

- Insurance products that are more investment-oriented, such as deferred annuities, may experience policyholder lapses and withdrawals in excess of expectations due to market conditions, such as an interest rate spike or equity market decline.
- For life insurance companies, pandemics and other covered extreme events can cause high death claims.
- Material financial or catastrophic events can trigger a large number of lapses.
- Reputational events, such as a downgrade, a major lawsuit, or a severe adverse press event, can result in a run-on-the-bank situation where large numbers of customers may leave, forcing the company to sell assets (potentially at a loss) to cover surrender value payments.

Discussion of ALM-Driven Liquidity Risk

The insurance industry, in general, is less vulnerable to liquidity risk than other financial sectors such as commercial banks. This is due to the tendency of customers to retain their insurance products even in adverse market environments[1] and the fact that many insurance liabilities are not callable, unlike demand deposits for a bank. For long-duration liabilities, companies can invest in long-duration, high-quality assets and hold them to maturity. However, under a low-interest-rate environment, companies may try to find incremental yield in alternative or illiquid assets, or may take on duration risk by investing in assets with a longer duration than the liabilities they back. Companies might also have increased their exposure to structured securities such as CLOs, CMBS, RMBS, or ABS.[2] Such assets may have higher cash flow uncertainty or less liquidity in the event there is a cash need.

This is categorized as an ALM-driven liquidity risk because investing in illiquid assets is not in and of itself a problem. It only becomes a problem when a liability needs to be paid and the illiquid or long-dated asset cannot be sold or can only be sold at a substantial loss.

Another aspect of ALM-driven liquidity risk is the reaction of assets and liabilities to different interest rates or economic scenarios. The goal of ALM is to match the behaviors of assets and

[1] This could be due to taxation issues, change in insurability, or because the rationale for purchasing insurance products is often to cover a protection need that remains.

[2] Collateralized loan obligations (CLOs), commercial mortgage-backed securities (CMBS), residential mortgage-backed securities (RMBS), and asset-backed securities (ABS) are all types of structured securities packaging the cash flows of pools of loans.

liabilities over a range of scenarios, thus minimizing mismatch as market values move. However, in some cases, the dynamic behaviors of assets and liabilities can diverge over time, creating liquidity stress. One recent example of this is the 2022 spike in interest rates. For many companies, the rising rates increased surrenders, thereby reducing liability duration while simultaneously lengthening the asset duration of callable bonds and assets with prepayment assumptions.

Discussion of Corporate Activities-Driven Liquidity Risk

The size and complexity of the group to which an entity belongs, its reinsurance or retrocession arrangements, and its non-insurance activities could increase liquidity risk.

Although being part of a large and complex group that spans global jurisdictions may offer liquidity advantages, a legal entity may also be more exposed to liquidity risk than is apparent due to the complexity of approvals when subject to multiple regulators or the inability of its ERM framework to oversee all interactions between the group's disparate units. Some companies rely on captive subsidiaries in different regulatory environments as well. An entity that relies on intragroup fungibility may be adversely impacted in the event of a systemic shock that affects the entire group or if the actions of one entity adversely affects the entire group.

Reinsurance is an important aspect of many companies' ERM framework. However, a reinsurer insolvency could potentially impact the timing of an insurer's cash flows. For example, some contracts have rating triggers, such that a reinsurer's rating downgrade can trigger a liquidity run on its liabilities. To the extent that one reinsurer is the primary counterparty for a specific product or industry segment, its insolvency could have a ripple effect.

Corporate structure can also affect fungibility of liquid assets. For example, many insurance companies operate as insurer groups with more than one legal entity. If a backstop plan for a liquidity or capital crisis involves moving capital between those entities, board or regulatory restrictions can limit the ability to transfer liquid assets between legal entities.

Finally, there could be non-insurance liabilities that generate liquidity risk, either at the insurance entity level (e.g., corporate debt) or from the activities of non-insurance entities within an insurance group.

Sources of Liquidity

Just as it is important to understand the sources of liquidity risk, management needs to know the possible sources of cash if the need arises.

Before a stress situation strikes, a company should take an inventory of its potential sources for liquidity, both with regard to how much liquidity each source provides and the numerous considerations that exist for using each particular source. The following represents various liquidity sources that are common in the life insurance industry:

- **Cash on hand:** Companies typically keep a portion of their assets in cash to meet immediate liquidity needs.
- **Asset sales:** Because assets are not all equally liquid, when assets must be sold, the company should have a priority order of sales. Short-term investments, government bonds, corporate bonds that are close to maturity, and publicly traded common stock with an active market are generally among the most liquid choices. However, even these may not be immediately liquid when one is trying to sell billions of dollars of assets within a few days. Furthermore, due to interest rate increases or credit deterioration of the issuer, these assets may have to be sold at less than book value or even less than what would be fair value in normal circumstances.
- **Secured loan from a Federal Home Loan Bank (FHLB):** The FLHB offers low-cost borrowing to insurance company members that pledge their commercial or residential mortgages or mortgage-backed securities as collateral.
- **Securities lending programs or repurchase agreements (repos):** These programs can be used as short-term sources of liquidity that are expected to be repaid or renewed quickly (within a year in many cases, but some include options for the lender to require repayment of the borrowed cash on much shorter terms).
- **Borrowing:** While a company is in good financial shape, it may wish to establish durable, evergreen (i.e., always available) lines of credit. The credit issuer should have an appropriately high credit rating to increase the chances that the resources will be there when needed. Attention is needed regarding the terms of the line of credit to ensure that draws would be available during a stress scenario with few or no negative repercussions. Use of the credit facility may lead to a downgrade if rating agencies view the increased debt burden as problematic.
- **Intercompany borrowing or dividends**: This may be feasible for company groups with multiple legal entities.
- **Increase sales:** If a company is in a severe stress situation, selling additional business is probably not a viable option. However, if the company needs cash in less stressful circumstances but does not want to sell assets or to borrow, an additional sales push may be

considered. The resulting incoming premiums can be redirected to cash, rather than immediately invested. However, it is important to recognize that in such a case, the new liabilities effectively become supported by the old assets the company didn't want to sell. This might have significant long-term profitability or ALM considerations.

Many of these liquidity sources require some degree of planning. Securities lending and repo arrangements take time to set up and may not be available in a crisis. Getting a new loan or line of credit is neither a short-term solution nor a crisis activity, but tapping into an already established line of credit that hasn't yet been drawn down can be done very quickly. If a company is already an FHLB member, pledging additional mortgage assets (if available) can be done fairly quickly, but it is also very feasible to pledge assets and not draw down all the cash right away, leaving immediately accessible cash for a crisis.

Liquidity Risk Analysis

Once the sources of liquidity risk and the sources that supply liquidity are identified, the goal of liquidity risk analysis is to quantify how these sources of risk and supply behave in normal and stress scenarios.

Liquidity risk analysis approaches can be classified into two groups: cash flow modeling and liquidity ratios. Both are complementary techniques that allow measurement and communication of liquidity risk in useful ways.

Cash flow modeling: While cash flow projections are often used for asset/liability matching and surplus testing, such as for the Actuarial Opinion and Memorandum, the projection mechanisms can be used as a starting point to examine liquidity exposure as well. Modifications typically include a more comprehensive view of the balance sheet, consideration of new business impacts, and shorter time steps.

Cash flow modeling starts with projecting all known cash flows, such as asset maturities, interest payments, and liability payments, including expected benefit payments, contractual GIC and funding agreement maturities, and debt or dividend cash flows for corporate financing efforts. These cash flows can be projected for a short or intermediate length of time, depending on how they are to be used. Projecting forward monthly for six- to 18-month "time horizon" may be a place to start. For liquidity management, material new business flows are typically estimated and added.

An analysis can then take place, assessing when the assets and cash inflows are insufficient to meet liability cash outflows and measuring how much additional liquidity would be needed to meet them.

Liquidity ratios: Liquidity ratios are a commonly used tool to assess a company's liquidity risk. The concept itself is straightforward. For a given point in time, liquidity-adjusted assets are

divided by liquidity-adjusted liabilities. If the resulting ratio is greater than some target number, such as 1.0, then the company can feel fairly confident that its exposure to liquidity risk is acceptable. If the resulting ratio is too small, the company will want to take steps to reduce the risk. For example, the assets or the liability mix may need to be restructured.

"Liquidity-adjusted" assets refers to the application of a haircut to the book value of the asset portfolio that considers two things: the difference between the book value and the market value of assets, and the execution costs involved in selling the assets needed over the desired time horizon and in the desired quantity. The larger the quantity and the shorter the timeline, the higher the execution cost.

"Liquidity-adjusted" liabilities rely on estimating what portion of the liabilities are going to turn into short-term cash outflows. This could be 100% for payments due in the near future that cannot be deferred, but they could also be as low as 0% for liabilities that are fully illiquid.

For more information on using haircuts to calculate liquidity adjusted assets and liabilities, refer to the 2000 Academy paper, pages 16-17.

In practice, these two risk analysis techniques can also be combined. For example, cash flow modeling can project potential liquidity needs from the liability side of the balance sheet, and haircuts can be applied to asset positions to estimate the cost of supplying liquidity from the asset side of the balance sheet to match those liability cashflow needs.

In general, liquidity ratios are useful for monitoring exposures and setting risk appetite measures. However, cash flow modeling will typically provide more insight for management of the business than standalone liquidity ratios.

Stress Scenarios

Regardless of whether a company chooses a cash flow modeling approach, a liquidity ratio approach, or a combined approach, a key feature of liquidity risk analysis is the use of stress scenarios along which to model liquidity needs. As the topic of liquidity risk has grown in importance to regulators and rating agencies, a number of liquidity stress scenarios have been proposed by various entities. These examples of stress scenarios are a few that others have considered worth analyzing:

- Loss of a key distributor—reduce new business premium and commissions by a factor; consider increasing surrenders as well.
- Mortality—a monthly factor of net death loss from a mortality stress event, like a pandemic, divided by a baseline net death loss.
- Life business—increase surrenders.
- Deferred annuity business—increase ALM basis (best estimate) or cash flow testing basis (padded or prescribed) surrenders.
- Variable annuity policyholder behavior changes as a result of a stock market decline.
- Maintenance expenses increase.

- Policy loans increase, as policyholders may take loans instead of surrendering.

Some of these stresses may occur simultaneously and could be tested together. Others may offset other stresses, as when a pandemic increases mortality and simultaneously increases life insurance new business premium. Other stress tests will be appropriate for other products and distribution channels.

Liquidity Management Framework

Just like other aspects of enterprise risk management within a company, a best practices liquidity risk management program starts with a strong framework: a risk tolerance statement, appropriate policies and limits, and clearly defined roles and responsibilities.

Risk Tolerance Statement

Often insurers include liquidity risk as a key component of their risk appetite framework and, as such, establish liquidity risk tolerances. A risk tolerance statement gives a company a way to clearly state what types, duration, and severity of liquidity stress scenarios the company is targeting to withstand. It is typical to establish desired tolerance metrics, such as liquidity ratios, under 'normal' conditions as well as 'adverse' conditions, where insurers may be willing to operate with a lower liquidity cushion than under normal conditions. It is a sound practice to also have a liquidity plan in place which rank-orders potential sources of liquidity to restore the liquidity risk metric to within tolerance.

Policies and Limits

Liquidity risk analysis feeds liquidity risk management in two primary ways: generating a better understanding of the drivers of liquidity stress in a company's assets and liabilities and providing a liquidity risk profile that is useful for setting policies and limits.

Liquidity risk limits are usually established based on the nature of the underlying business, including considerations for:

- Predictability and stability of the net cash flows of the product.
- Optionality in the products, such as expected policyholder "stickiness" in times of stress, and ability to accurately quantify optionality.[3]
- Timing of liquidity demands based on contractual and regulatory requirements.
- Quality and nature of assets backing liabilities, including how their values and cash flows would be expected to change in times of stress.
- Access to lines of credit, both external and intercompany lending, with consideration of leverage limits and regulatory constraints.
- Access to cash and on-demand assets at financial institutions.

[3] A risk margin on this assumption may be appropriate.

- The impact of market and insurance risk events, separately and combined, on liquidity sources and demands.
    - For example, rising rates can increase surrenders (reducing liability duration) while lengthening the asset duration on callable bonds or assets with prepayment patterns.

Examples of liquidity risk limits include:

- Day-to-day working cash targets.
- Minimum market value of high-quality liquid assets available over a defined time horizon.
- Minimum liquidity-stressed value of less liquid assets (intended to be used in a stress event) available over a defined time horizon, and/or a liquidity ratio target.
- Minimum values available in contingent funding sources, and the time horizon over which they could be accessed.

Since stress liquidity risk is always present, the cash requirements dictated by stress events will dominate liquidity risk limits unless contingency plans are in place. A discussion of contingency funding plans and suggestions for strategically reducing risk via product design are included in the "Liquidity Risk Management for Stress Events" section below. Setting liquidity risk limits should take into consideration the contingency funding plans expected to be activated in times of stress.

Roles and Responsibilities

Effective liquidity management requires communication and coordination through a strong corporate oversight function, as a stress event response may be carried out across several departments and roles within a company, including treasury, investments, actuarial, compliance, and operations.

The risk function is responsible for setting and monitoring limits, developing contingency funding plans, and identifying the need to initiate such plans. It is also very helpful for the risk function to work with treasury ahead of time to prepare the processes that will be needed for crisis reporting. In a severe stress event, daily or even intraday reporting on cash demands and cash availability may be essential for managing through the event.

Actuaries have a key role in the liquidity risk management process, identifying and modelling liquidity needs under normal and stressed scenarios. This modeling role might intersect with investments or the corporate risk function, considering items such as:

- New product features and embedded liquidity options in current products.
- Underwriting or event risk scenarios that could affect cash inflows or outflows, like disintermediation, surrenders, pandemics, natural catastrophes, etc.
- Recognizing when the usual interaction among assumptions no longer holds.
- The impact of tail events on financial markets and policyholder behavior.
- Collateral calls on hedges or borrowing.
- Cost of the various sources of liquidity in a crisis event.

The company's liquidity risk management framework should be integrated into its wider risk management framework and should be used to inform day-to-day operations and key business decisions.

Liquidity Management in Normal Environments

Liquidity management should be designed to provide required cash at the appropriate time, while simultaneously allowing for investment policies that deliver competitive risk-adjusted returns on investments. Given that financial institutions are willing to accept some amount of liquidity risk, that risk must be managed appropriately. Outside of stress liquidity events, liquidity management is a cooperative effort between three primary functions: treasury, investments, and actuarial.

In normal environments, the treasury department can manage day-to-day cash needs by balancing cash positions and lines of credit. To monitor this, the treasury department might use a cash rollforward report that shows a summary of the main cash activities split by legal entity over the next 30 days to ensure that cash and cash equivalents are enough to cover daily outflows.

Underpinning the treasury department's efforts are the ongoing/intermediate term cashflow projection and asset-liability management efforts of the actuarial and investment teams. If projections of ongoing cash needs over the next six to twenty-four months indicate a high risk of future cash needs exceeding future available cash, management would need to develop a plan to increase liquidity to meet those needs. Ongoing liquidity management tools can include restructuring or fine-tuning the portfolio, selling more or fewer of selected products, diversifying where possible, and changing the investment strategy if needed (e.g., increasing high quality public securities and reducing commercial mortgage acquisitions).

Liquidity Risk Management for Stress Events

Liquidity stress events can range from disruptive to catastrophic. It is essential that liquidity risk be monitored continuously to identify unfolding stress events and execute action plans to create or restore liquidity.

The keys to successful management of liquidity risk in a stress event are product design or liability structure, portfolio strategy, systematic monitoring, and preparedness to act. It is worth highlighting that all of these require planning and preparation long before a liquidity event occurs.

Liquidity risk can be reduced substantially by attention to product design, customer and sales mix, liability structure, and portfolio strategy. Some suggestions that may be helpful include:

- **Include surrender charges and market value adjustments:** MVAs are particularly helpful in reducing the appeal of surrenders in rising rate environments by increasing the surrender charges when rates have risen since the contract was issued.
- **Include deferred payment provisions:** Most retail life insurance products are covered by standard nonforfeiture laws, which allow insurers to defer cash surrender payments for a six-month period. This time could be vitally necessary in order to generate liquidity in a severe crisis, should such provisions be available and activated appropriately.
- **Diversify liabilities:** Diversification on the liability side by market, product, channel, etc. can reduce exposure to liquidity risk. One aspect of diversification that might be overlooked is the distribution of institutional versus retail contractholders. In the event of a reputation issue or negative news report, institutional contractholders are more likely than retail contractholders to obtain immediate knowledge of adverse events and act on that knowledge. This is because institutional contractholders tend to be more investment-oriented, while retail contractholders tend to be more protection-oriented for many life insurance products.
- **Ladder liability maturities:** With liabilities maturing at staggered dates, the company is not forced to "flood" the market with new sales to maintain its level of inforce business. During a "run on the bank," a company may be unable to issue new contracts or, if they can, only on unfavorable terms. Note that this also applies to liabilities such as capital loans, bond issuances, or surplus note issuances. Staggering maturity or coupon dates can be very helpful to avoid needing a large amount of liquidity at one time, or depending wholly on the ability to refinance debt when it comes due.
- **Diversify assets:** An asset portfolio that is well diversified from all perspectives is less susceptible to a stress situation. Assets can be diversified by asset class, issuer, industry, region, duration, etc.
- **Cash flow match:** Laddering asset maturities to closely match liability maturities and expected payments increases the chances that there will be cash on hand to meet cash demand.
- **Set and enforce appropriate investment policies:** Beyond using investment policy limits to control exposure to risky asset classes, the investment policy should be considered through the lens of liquidity risk. Can the assets be turned into cash? Can they be pledged to the FHLB or in a repo arrangement? Do they have particular characteristics that create dynamic exposure to interest rates or economic conditions that won't match the liabilities?

Monitoring liquidity risk without an appropriate action plan is incomplete risk management. When the liquidity risk level is too great, corporate management must be aware of the tools that it has available with which to lessen the risk, and it must be willing to use them when necessary.

Perhaps the single most valuable step an insurance company can take to prepare for a stress liquidity event is to create a written contingency funding plan (CFP).[4] The goal of a CFP should be to identify potential crisis events and detail the warning signs and potential responsive actions. It is important that a CFP be a living document, not a static one, so that it stays relevant and accessible in a time of stress. The CFP should list the sources and amounts of liquidity available to a company, identify what would trigger accessing those sources, and who would approve accessing those sources.

The process of creating and updating such a plan helps a company walk through each source of liquidity and identify any prep work that needs to occur before a stress event happens. For example:

- If FHLB lending is a source of liquidity:
    - Does the company have assets pledged that haven't been drawn against?
    - Does the company have eligible collateral, and if so, how long would it take to pledge it?
- Many policies and contracts have deferral provisions, either in the documents themselves or under statutory provisions, which allow an insurer to take extra time to fulfill the cash obligation. But deferral rights only work if they are exercised and the deferral can be administered correctly.
    - If this provision is accessed, the state Department of Insurance must be notified.
    - This choice would cause a reputation issue. What is the trigger and approval process?
    - Can the administration system handle this? Can claim processing and payment delivery be separated in the claims administration systems?
- If new premium income will be used to pay surrenders:
    - Is there a process to determine whether selling assets and realizing losses is better or worse than the change in value of new business from failing to invest new premiums at current rates?

There are many other such questions and considerations that are expected to come to light in the process of developing a written contingency funding plan.

In addition, this plan will help a company identify possible restrictions on availability of liquidity in a period of crisis, such as:

- Limitations on inter-company dividends.
- Impact of a company downgrade on availability of funding from repo arrangements.

[4] Contingency Funding Plan (CFP) is a term used by banks and a requirement under the FDIC, but we are using this term here because the structure and purpose of a CFP is precisely what we describe here for insurance companies.

- Increased liquidity needs caused by a company downgrade (additional collateral requirements).
- Limitations on the ability to roll forward funding arrangements.

Once a CFP has been created, it should be reviewed frequently to ensure there have been no meaningful changes that affect the sources and uses of liquidity. Responding appropriately in a stress event can be as time sensitive as the company's disaster recovery or business continuity process.

To that end, the CFP should also establish a "liquidity event management" team that is business-model-specific. This would have many parallels to a crisis management team used in a disaster recovery plan or a catastrophe management team used by a P&C company in a catastrophic event. Team roles and responsibilities would be established in advance and could include members from executive management, investments, treasury, actuarial, compliance and operations.

Conclusion

Effective liquidity risk management is, much like the management of other risks in an insurance company, a team effort. Actuaries play an important role in the process and this practice note encourages actuaries to actively engage with others in their company to enhance liquidity risk management practices.

The appendices provide further information on the ever-evolving landscape of regulatory practices regarding liquidity risk, as well as discuss aspects of liquidity risk management that apply to health and property & casualty insurers.

APPENDIX I: Recent Publications

Liquidity risk management, including liquidity stress testing, is a significant area of focus for insurers and their regulators in the United States and beyond. Recent publications related to liquidity risk include:

- *NAIC 2022 Liquidity Stress Test Framework for Life Insurers Meeting the Scope Criteria* (December 2022)
- *Liquidity Risk Management* (2019 Application Paper from the International Association of Insurance Supervisors)
- *Prudential Regulatory Authority Consultation Paper on Liquidity Risk Management for Insurers* (2019 Consultation Paper from the Prudential Regulatory Authority)
- Section 2.3 of *Proposed Enhancements to the Regulatory Regime for Commercial Insurers* (2023 Consultation Paper from the Bermuda Monetary Authority)

Certain recent regulatory developments that affect liquidity management include the following:

Insurance Holding Company Systems Regulatory Act ("Model #440") requires insurance holding companies to submit Form F (Annual Enterprise Risk Report) to their domiciliary state insurance department. Key information in Form F includes:

- Identify and outline the insurer's systemic enterprise risks;
- Provide regulators access and monitor insurers' risks and governance at the insurance holding company level;
- Include the insurer's liquidity funding sources through the Insurance Holding Company System.

Model #440 was also recently updated to incorporate liquidity stress testing. The amendment is in the process of being adopted by states in 2024. The focus of this stress test is understanding the systemic risk of asset sales across the insurance industry in a global liquidity event.

There have also been advancements in the *International Association of Insurance Supervisors* (IAIS) *Insurance Core Principles* (ICP).

- ICP 16 Enterprise Risk Management for Solvency Purposes. ICP 16 includes requirements for liquidity risk disclosures, namely:
    - Liquidity risk management strategy, policies and processes.
    - Liquidity risk stress test.
    - Submission of a liquidity risk management report.
- Under ICP 20 Public Disclosure, there is a requirement for at least annual public disclosure of the insurer's liquidity risk.
    - Insurers are expected to provide information with appropriate detail and in a manner that is publicly accessible.

APPENDIX II: Liquidity Risk for Property/Casualty (P&C) Insurers

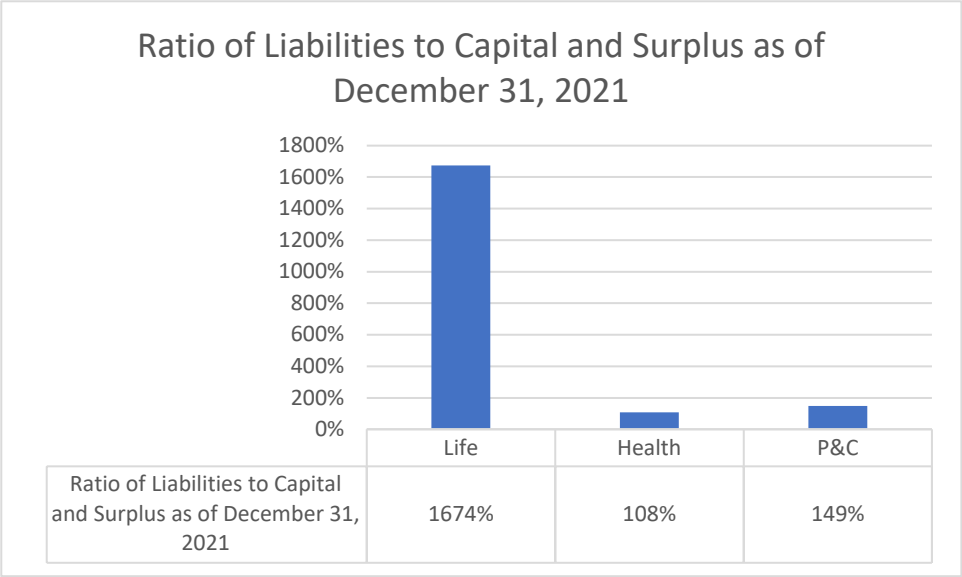
Like all financial institutions, P&C insurers are subject to liquidity risk. However, the magnitude of this risk tends to be much lower than the liquidity risk associated with life insurers.

Some of the reasons why liquidity risk is typically not as material to P&C insurers include:

- P&C claim liabilities are typically the largest liabilities on the balance sheet, as opposed to unearned premium liabilities, and P&C claim liabilities are not callable.
- P&C claim liabilities are unchanged by policy cancellation.
- With regard to P&C unearned premium liabilities, P&C policies for most coverages have a policy duration of 12 months or less, with the most common P&C products involving mandatory coverages.[5] As such, mid-term cancelation is not an option for many policyholders unless they have a replacement policy already purchased. It is far easier with a 12-month or shorter duration to replace the policy upon renewal, rather than to cancel mid-term.
- P&C liabilities do not include a credited interest rate, and as a result there is no incentive for policyholders to cancel their policies mid-term in order to take advantage of higher prevailing interest rates.
- P&C liability duration is typically five years or less, as opposed to decades as in the case of life liabilities. Therefore, the risk of asset-liability mismatching is typically not significant for P&C insurers.
- P&C insurers are typically much less leveraged than life insurers in terms of policyholder surplus in relation to the liabilities. As a result, the need to liquidate assets is less likely to impact solvency.
- P&C insurers typically hold a relatively higher percentage of assets in liquid, lower-earning asset classes as a liquidity cushion.

A comparison of the leverage ratios between life, health, and P&C insurers is shown below, defined for this purpose as the ratio of liabilities to capital and surplus. This comparison highlights that life insurers are much more leveraged than health and P&C insurers.

[5] Mandatory coverages include auto liability in many states, homeowners policies where the mortgage holder requires insurance coverage as a condition of the mortgage loan, and workers' compensation coverage for most businesses.



Source: S&P Global

Sources of Liquidity Risk for P&C Insurers

The two most prominent sources of liquidity risk for P&C insurers are:

- Catastrophic events, such as pandemic, natural catastrophes, or terrorism, that cause losses for a broad range of policyholders simultaneously; and
- Fronting for large risks or an aggregation of risks, such that the gross exposure to the insurer exceeds the insurer's available resources. (This can take the form of either ceded reinsurance or casualty deductibles.)

A related risk in both cases is the risk that reinsurers or other related counterparties will not meet their obligations in a timely manner (or at all, as may be the case if reinsurers become insolvent or initiate a dispute with the ceding insurer).

Managing Liquidity Risk for P&C Insurers—Catastrophes

Major catastrophes can create significant short-term cash needs for P&C insurers. This risk is mitigated by the fact that catastrophe-related losses are not paid immediately after the catastrophe, but first involve investigation and estimation of the size of the loss before claim settlement occurs. That process can take many months, with larger catastrophes typically involving longer delays. These longer delays for major events are caused by the demand for contractors, architects, building inspectors, and building supplies needed to repair the damage overwhelming the local supply of such. The resulting payment patterns extend to a year or longer in length, with a larger event correlating with longer delays.[6]

[6] Any litigation arising from the catastrophe can extend for many years after the event, regardless of its size.

Liquidity risk management approaches related to catastrophes include:

- Limiting exposures to acceptable levels of risk tolerance through the use of catastrophe models.
- Limiting concentration risk, e.g., the insurer's aggregate exposure related to single locations or groups of locations that could be impacted by a single event.
- Implementing a catastrophe reinsurance program with sufficient protection for stress events relative to the insurer's resources, with a panel of financially strong reinsuers.
- Including contract provisions with reinsurers allowing for faster reimbursement.
- Stockpiling cash in advance of hurricane season, or immediately upon occurrence of a catastrophic event before the claim settlement process starts.[7]
- Maintaining a liquidity cushion.
- Maintaining access to supplemental liquidity through bank credit facilities, an active commercial paper or short-term debt program, or borrowing rights through securities pledged at the FHLB.
- Limiting investments in less liquid private placement securities, alternative assets and real estate to an acceptable level aligned to the company's liquidity exposure.

In summary, catastrophe risk can pose liquidity risk for P&C insurers. However, this risk can be managed before, during, and after catastrophic events through exposure management (typically through the use of catastrophe models), appropriate use of reinsurance, cash management strategies, and the maintenance of a liquidity cushion.

Managing Liquidity Risk for P&C Insurers—Fronting

Fronting entails the use of a licensed, admitted insurer to write business on behalf of an entity seeking to enter a new market or geography or seeking to write where the entity does not have a license.[8] In return, the fronting carrier receives a fee. The fronting carrier cedes all or most of the business but retains ultimate responsibility for paying the claims. P&C insurers can face liquidity issues if the gross exposure associated with the fronted business is large in relation to the insurer's available resources.

Liquidity risk management approaches related to fronting business include:

- Limiting aggregate gross exposures to acceptable levels of risk tolerance.
- Carefully choosing fronting partners, such that the assuming entity is one that is financially strong and reputable.

[7] This stockpiling can include using cash inflows from new/renewal premium flows to build up the cash position, rather than immediately investing those new cash flows. The greater the geographic spread of the P&C insurer's writings, the greater the opportunity for this practice, as catastrophes are generally limited in the size of their footprint. In addition, as assets mature, a P&C company typically can retain the proceeds in the form of cash rather than immediately buying longer-term investments.

[8] Examples include captives and international entities seeking to write U.S. business.

- Including contract provisions with the assuming entity allowing for direct payment of claims by that assuming entity.

Casualty deductibles can also be a form of fronting, whereby the P&C insurer pays the claims gross of deductible and then seeks reimbursement from the insured for the deductible portion. The risks and management approaches for this form of fronting are similar to those for fronting via reinsurance.

Liquidity risk associated with fronting business is an issue that P&C insurers can avoid with prudent management; insurers are under no obligation to front at all.

Liquidity Risk for P&C Insurers—Summary

Given the material excess of assets over liabilities for P&C insurers, the net runoff of liabilities can be a net positive runoff cashflow for most years, without any projected asset sales. When supplemented with the cashflow from new and renewal policies (where those incoming cash flows do not require immediate investment), P&C insurers can normally avoid any forced asset sales with proper management, even in stressed situations.

Overall, managing liquidity risk is much more straightforward for P&C insurers than it is for life insurers. The material excess of assets over liabilities makes it possible to hold a liquidity cushion that allows for a range of volatility in projected outflows. New cash flows from new and renewal policies can be redirected to handle stressed outflows that might otherwise require prematurely liquidating assets. Where the slow payout by a counterparty such as a reinsurer or fronted party could cause liquidity risk, that risk can be addressed by contractual terms with the counterparty. As a result, liquidity risk is not as material risk for the P&C industry as it is for the life industry.

APPENDIX III: Liquidity Risk for Health Insurers

As is often the case when talking about health insurance, liquidity risk considerations for health insurers are somewhat different with respect to longer-tailed health lines of business (e.g., long-term care, disability income) versus shorter-tailed health lines of business (e.g., medical), with the considerations for longer-tailed health lines resembling those for life insurers and the considerations for shorter-tailed health lines resembling those for P&C insurers.

For longer-tailed health lines, the insurer's actuarial reserves are in general not callable by policyholders, as the underlying products do not provide the policyholder with any cash value. A notable exception is return-of-premium riders on individual disability income products. However, as these riders typically give policyholders the ability to extract cash from the insurer only at predetermined points in time, such as every fifth anniversary of the policy's inception, the liquidity risk posed is relatively constrained and easier to anticipate.

In the low-yield environment of the 2010s and very early 2020s, health insurers writing longer-tailed lines increasingly invested in relatively illiquid assets, including private equity funds, to generate increased investment returns and improve the underlying economics of these lines of business. However, considering the lack of callability of the associated reserves, the insurer's future liability cash flow needs are relatively insensitive to changes in the economic environment, minimizing the risks to the insurer of making illiquid investments assuming application of sound asset-liability management practices. As yields have risen in the early 2020s, it is plausible that health insurer interest in these illiquid asset classes will diminish, as suitable investment yields are becoming more readily obtainable in more traditional asset classes.

Turning to shorter-tailed health lines, the insurer's actuarial reserves are generally for unpaid claims that will be paid out in a manner of weeks or months, rather than years. Furthermore, these products are typically written at combined ratios below 100% and are not subject to the same type of catastrophe risks faced by many P&C products. It is important to note that COVID-19 was, in most cases, a net boon to health insurers as increased claims directly attributable to the pandemic were outweighed by the impact of other health care services that were not consumed in light of shutdown policies. For these reasons, liquidity is frequently not a top risk for insurers writing shorter-tailed health products. These insurers typically keep enough of their portfolio invested in cash or cash equivalents to cover most, if not all, of the actuarial reserves. While many health insurers do invest in other asset classes, including public equities, those riskier assets are typically backing the insurer's surplus, as opposed to its reserves.

One area of potential liquidity risk unique to shorter-tailed health insurance lines involves programs where adverse experience will ultimately be transferred from the insurer to the government. Before the transfer occurs, the insurer may experience significant net cash outflows while awaiting reimbursement from the government. Examples of such programs include the low-income cost-sharing and reinsurance aspects of Medicare Part D, where the insurer administers certain aspects of the program on behalf of the government, receiving a monthly

subsidy payment, and then after the completion of the year the subsidy payments are trued-up to reflect actual experience. Other examples include the so-called risk corridor programs found in Medicare Advantage and some Medicaid programs, in which a defined portion of an insurer's losses get reimbursed annually by the government. In an extreme case, as experienced by some insurers participating in the individual health insurance market since 2014, a solvent insurer could experience a significant liquidity challenge due to a timing difference between negative net operating cash flows and the future cash inflows from the settlement of associated government receivables.

Another type of liquidity risk faced by many larger health insurers relates to corporate structure complexity. For various non-financial reasons, it is common for major U.S. health insurance holding companies to operate through dozens of different state-regulated operating subsidiaries. Managing the capital needs of each subsidiary, such as ensuring each subsidiary is adequately capitalized, as well as the capital needs of the entire holding company group, such as ensuring sufficient cash can be sent upstream from operating subsidiaries to meet the parent's objectives with respect to returning capital to investors, can be a complex endeavor. This is particularly true when considering the number of entities and number of different domiciliary insurance regulators involved.