

Liquidity Risk in the Bermuda Long-term Insurance Market

30 August, 2024

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1. Executive Summary

A combination of factors, including an increase in investments in alternative assets by long-term insurers¹, rising interest rates and the recent regional banking crisis of 2023 in the United States, have led to public debates in which liquidity risk has often been called out as one of the key risks for long-term insurers. With the large-scale changes in the Bermuda Rules for long-term insurers earlier this year, liquidity risk management has also been a major focus point for the Bermuda Monetary Authority (Authority or BMA). This report has been prepared to provide a detailed review of how long-term insurers operating in Bermuda manage liquidity risk and the part regulation plays, with an emphasis on liquidity risk associated with both assets and liabilities. The report delves into the nature of liquidity risk within the insurance sector, explores different insurance lines, and discusses the strategies insurers use to manage liquidity risk.

The Authority requires that long-term insurers' liquidity risk management cover both qualitative and quantitative aspects. This includes assessing the liquidity of assets and liability outflows under various stress scenarios and time horizons. The analysis of the data received by the BMA reveals that long-term insurers in Bermuda, with the typically limited liquidity of their liabilities, generally have a business model that is naturally robust against liquidity challenges, strengthened by the industry's liability-driven investment philosophy, and contingency liquidity plans that long-term insurers have in place.

In more detail, this report includes the following observations:

- Bermuda long-term insurers maintain a substantial portion of their assets in liquid forms, such as cash, corporate bonds and sovereign securities. This diversification against less liquid assets on the balance sheets results in long-term insurers in Bermuda having relatively high liquidity coverage ratios (median 418% post 1-200 years stress test), which indicate sufficient liquid assets that can be used to meet (immediate) outgoing liability cashflows in a stress event that impacts both assets and liabilities adversely.
- An explanation for this overall resilience against liquidity shocks, as shown by the data, may be found in both generic features of long-term insurers as well as the specific features of both assets and liabilities of Bermuda long-term insurers. Long-term insurers generally have a business model with illiquid liabilities that is naturally more robust against liquidity challenges compared to, for example, banks with short-term liquid liabilities and typically longer-dated assets. From an asset allocation perspective, Bermuda's long-term insurers have a diversified investment mix with a high allocation to highly liquid assets that can be used in a liquidity risk stress event. At the same time, the insurance products underlying the liabilities, as well as the nature of the mainly reinsurance-dominated market in Bermuda, contain several features that mitigate liquidity risks as a result of surrenders by policyholders.
- While the overall long-term sector in Bermuda shows strong resilience against liquidity shocks, there are companies that face liquidity shortages under the BMA stress scenarios. The BMA engages with the management of these companies to ensure adequate risk mitigation measures. This is achieved through company-

¹ For this report, insurers also include reinsurers.

specific deep dives as well as targeted sector-wide assessments and the CISSA process in which insurers are required to run company specific liquidity stress tests.

- It remains important that long-term insurers in Bermuda continue to enhance their liquidity risk frameworks in view of the volatile operating environment. This is stimulated by increased requirements by the Authority in terms of liquidity risk reporting introduced in the recent review of the Bermuda Rules for long-term insurers, as well as increased focus on company-specific stress tests required in the CISSA and thematic reviews and on-site inspections conducted by the BMA. For reserving, firms adopting the Scenario-Based Approach are required to meet additional liquidity requirements.



2. Liquidity Risk in Long-term Insurance

Liquidity risk is the risk that a company may not be able to meet its short-term and long-term cash flow and collateral obligations. This risk may stem from various sources, including but not limited to market disruptions and forced sales, changes in customer behaviour, rating downgrades/defaults, or unexpected claims. Liquidity risk for long-term insurers arises primarily from the timing mismatch between assets and liabilities cashflows.

Long-term insurers with long-term liabilities tend to be less vulnerable to liquidity risks than banks². Contrary to banks with swiftly accessible short-term or demand deposits, long-term insurers often carry illiquid, long-term liabilities that grant them a longer investment horizon. This allows them to allocate some of their funds in less liquid assets and earn the illiquidity premium over time. Banks' business model is based on converting short-term obligations, such as deposits, into longer-term assets, such as residential mortgage loans. This process inherently carries, in a fundamental way, liquidity risk, which arises from the mismatch in the durations of assets and liabilities.

While long-term insurers may also face liquidity risk, this is much less fundamental than is the case for banks. Certain long-term products, particularly those focused on savings, tend to experience moderate liquidity risk, primarily due to potential abrupt changes in policyholder behaviour during volatile interest rate periods. Long-term products focused on pure protection generally carry minimal liquidity risk due to the inherently illiquid nature of their liabilities.

Liquidity risks for insurers can be categorised into those originating from liabilities and those from assets, both of which will be discussed in the following sections. Given the fundamental differences between the business models of banks and insurers, it is important to approach comparisons between liquidity risks in the insurance and banking sectors with caution. While banks have, as a result of their business model, inherent liquidity risk, in contrast, the insurance sector's exposure to liquidity risk is more closely tied to specific product features and is less influenced by structural factors inherent in business models.

Long-term insurers are less exposed to liquidity risk compared to banks, as has been proven in recent years with volatile financial markets and banking failures due to liquidity risk. According to the 2023 Global Insurance Market Report by the International Association of Insurance Supervisors (IAIS), there was a slight decline in the average insurance liquidity ratio in 2022, mainly attributable to reduced asset values. Nevertheless, with ratios maintaining well over 100%, the IAIS concluded that insurers generally possess substantial liquid assets, ensuring preparedness for potential liquidity demands.

However, as mentioned earlier, instances of urgent liquidity needs can still occur. For example, increased interest rates can cause policyholders to cash out their policies earlier than expected by the insurer. Combined with potentially illiquid assets on the balance

² For more elaboration on the differences between banks and insurers, see for example "Liquidity Risk in Insurance", The Geneva Association, July 2024

sheet, which could be challenging to liquidate at true market prices, an insurer might face a liquidity shortfall in the short term, even though it may still be adequately capitalised.

For these reasons, it is essential that regulators work together globally to address gaps in regulatory frameworks regarding liquidity risk. Regulators should further enhance insurance regulation by focusing on liquidity stress testing, risk management planning and indicators of liquidity risk. This will help further improve the industry's readiness for potential liquidity challenges. The BMA has been at the forefront of these developments following the review of the Bermuda Rules for long-term insurers earlier this year, which will be further discussed in the next paragraphs. At the same time, the Authority will, continue to play an active role in the global regulatory discussion around liquidity risk for insurers.

2.1 Key Drivers of Liquidity Risk

Despite the different business model compared to banks, liquidity risk for long-term insurers still arises from various sources. This includes the nature of the assets held and market conditions. From the liabilities of long-term insurers, there are also potential triggers for liquidity risk. Some long-term products contain, for example, optionalities for policyholders. The exercise of these options could – if unexpected and involves a large group of policyholders at the same time – trigger short-term liquidity needs for an insurer. Long-term insurers, therefore, need to have sufficient liquid assets to meet policyholder claims and other liabilities without incurring significant losses. Effective liquidity risk management involves assessing both the liquidity of assets and liability cash outflows under various stress scenarios.

Key drivers of liquidity risk in long-term insurance include:

- **Illiquid Assets:** Investments in illiquid assets can pose a significant risk during periods of financial stress when these assets may be difficult to sell without incurring substantial losses
- **Interest Rate Increases:** Rising interest rates can lead to increased policyholder lapses, resulting in higher liquidity demands. On the asset side, interest rate increases can lead to extensions of principal payments on callable securities
- **Reinsurer Defaults:** Defaults by reinsurers can disrupt expected cash inflows, increasing liquidity risk
- **Lower-than-Expected Premiums:** A shortfall in new business and renewal premiums can strain liquidity
- **Margin Requirements on Derivatives:** Fluctuations in derivative markets may require insurers to post additional collateral, impacting liquidity
- **Repo Market:** Changes in the repo market can affect the liquidity of assets held as collateral

The list provided is not exhaustive, but it indicates that liquidity risk can originate from various parts of the balance sheets of long-term insurers. Hence, a comprehensive perspective on liquidity risk management by both regulators and the industry is essential.

2.2 BMA Liquidity Risk Requirements

Following the review of the Bermuda Rules for long-term insurers earlier this year, Bermuda insurers must adhere to rigorous liquidity risk management requirements. The BMA mandates a holistic liquidity risk management framework that long-term insurers must adhere to. This framework includes the following key components:

- **Board-Approved Program:** Insurers must have a liquidity risk management program approved by their board of directors. This program needs to include clear ownership of key elements, annual reviews, and well-defined roles for first and second-line functions
- **Cash Flow Dynamics:** Insurers are required to identify and understand the sources of cash inflows and outflows under various scenarios. This includes setting a liquidity risk appetite, which is informed by stress testing and approved by the board
- **Liquidity Metrics and Targets:** Clear liquidity metrics and thresholds must be defined, operationalising the insurer's risk appetite. This includes maintaining a register of cash needs and sources, along with a liquidity buffer of highly liquid assets to address potential cash shortfalls
- **Stress Testing and Contingency Plans:** Insurers must conduct stress tests covering both fast-moving and sustained scenarios, including liquidity reverse stress tests. They also need to develop and regularly test a liquidity contingency plan to address potential liquidity deficits

Long-term insurers in Bermuda must conduct stress tests under both moderate (1-in-20 years) and severe (1-in-200 years) scenarios and report the outcomes to the BMA. These stress tests simulate various market conditions as well as liability stresses to evaluate how well insurers can withstand liquidity pressures.

The Authority also requires insurers to maintain a liquidity buffer consisting of highly liquid assets that can be readily converted to cash. This buffer is designed to cover unexpected cash outflows, ensuring that insurers can meet their obligations even under severe stress conditions. Insurers must meet a 105% Liquidity Coverage Ratio (LCR), which means that available liquid sources must be higher than the potential surrender after a severe liquidity stress scenario.

In addition to these requirements, which focus on managing liquidity risk, companies using the Scenario-Based Approach (SBA) for reserving must meet additional liquidity requirements. As part of the review of the Rules earlier this year, detailed liquidity risk reporting is in place as part of the SBA framework. Companies that use the SBA and have lapse risk in their liabilities are required to run additional liquidity and lapse stress tests and meet detailed reporting requirements. The liquidity reporting requirements as part of the SBA are both qualitative and quantitative, including detailed breakdowns required for (best estimate and lapse stressed) cash inflows and outflows and qualitative questionnaires on, for example, reverse liquidity stress tests and how liquidity shortfalls are modelled.³

³ More details can be found in 'INSURANCE (PRUDENTIAL STANDARDS) (INSURANCE GROUP SOLVENCY REQUIREMENT) AMENDMENT RULES 2024' and 'Lapse, liquidity and scenario-based approach returns' (www.bma.bm/document-centre/discussions-consultation-papers-insurance)

2.3 Liquidity Risk Management Practices

Liquidity risk is also a key point of attention in the on-site inspections of the BMA, both for individual insurers and sector-wide. Companies are required to perform internal liquidity stress tests, which are based on the company's specific risk drivers, in addition to the regulatory stress tests.

In 2023, the Authority conducted a targeted survey to assess the impact of rising interest rates on lapse rates and liquidity risk. The survey revealed that while lapses increased significantly from Q4 2022 into Q1 2023, most insurers were able to manage these increases within expected ranges. Regular stress testing and reporting to the board were identified as crucial components of managing liquidity risk.

The BMA also reviews the reporting of internal liquidity risk stress tests that companies include in their CISSAs under Pillar 2. Long-term insurers include liquidity risk appetite monitoring, internal stress tests, and qualitative commentary on their liquidity risk frameworks in their CISSAs. The CISSAs show a range of liquidity risk management practices at long-term insurers in Bermuda.

Some companies have a more quantitative approach towards liquidity risk, while others have a more qualitative risk management approach. Most of the companies adopt a combination of quantitative and qualitative measures to manage liquidity risk. For example, some companies set a minimum liquidity requirement, which is the amount of cash and liquid assets that the company needs to meet its expected cash outflows over a one-year horizon under normal business conditions. Some companies calculate this requirement based on their projected cash flows from their assets and liabilities, as well as their operating expenses and dividends. These projections consider the availability and cost of external liquidity sources, such as bank lines, asset sales, and capital markets. Different monitoring frequencies are adopted, such as reporting to senior management and the board of directors on a monthly basis.

Companies also set contingency liquidity requirements, which are the amount of cash and liquid assets the company needs to meet its expected cash outflows over a one-year horizon under a moderate stress scenario. This scenario is, for example, based on a combination of historical and hypothetical events that could affect the liquidity position, such as adverse market movements, increased surrenders, reduced inflows, or rating downgrades. Companies estimate the impact of these events on the incoming and outgoing cash flows liquidity sources and determine the amount of additional liquidity they would need to cover the shortfall. Monitoring of these more severe scenarios usually happens on a less frequent basis, for example, on a quarterly basis.

The CISSAs, on-sites and surveys show different levels of maturities in the liquidity risk frameworks of long-term insurers in Bermuda. Given these different levels of maturity, it remains important that insurers continue to develop their internal liquidity risk management processes. This is particularly important in light of the insurers' allocation to illiquid assets and potential liquidity needs as a result of short-term cash flow needs stemming from the liabilities driven by market dynamics.

3. Asset Allocations and Available Liquidity Sources

As explained in the previous paragraph, liquidity risk can arise from the asset side of the balance sheet via different sources, including illiquid assets. Effective liquidity risk management requires a careful balance between liquid and illiquid assets. Liquid assets, such as cash and marketable securities, can be used to meet immediate liquidity needs. Illiquid assets, such as real estate and private equity/credit, may be more challenging to sell quickly without significant losses.

3.1 Asset allocation

In the chart below, taken from a study conducted by Moody's⁴, a comparison of asset allocations of long-term insurers in different jurisdictions, including Bermuda, is provided. While there might be differences in the type of assets insurers invest in at the sub-category level (for example, type of structured assets), there is a similar trend in sub-aggregate. This can be seen in the allocation to, for example, illiquid assets (a category including structured assets, real estate, mortgage loans and other loans).

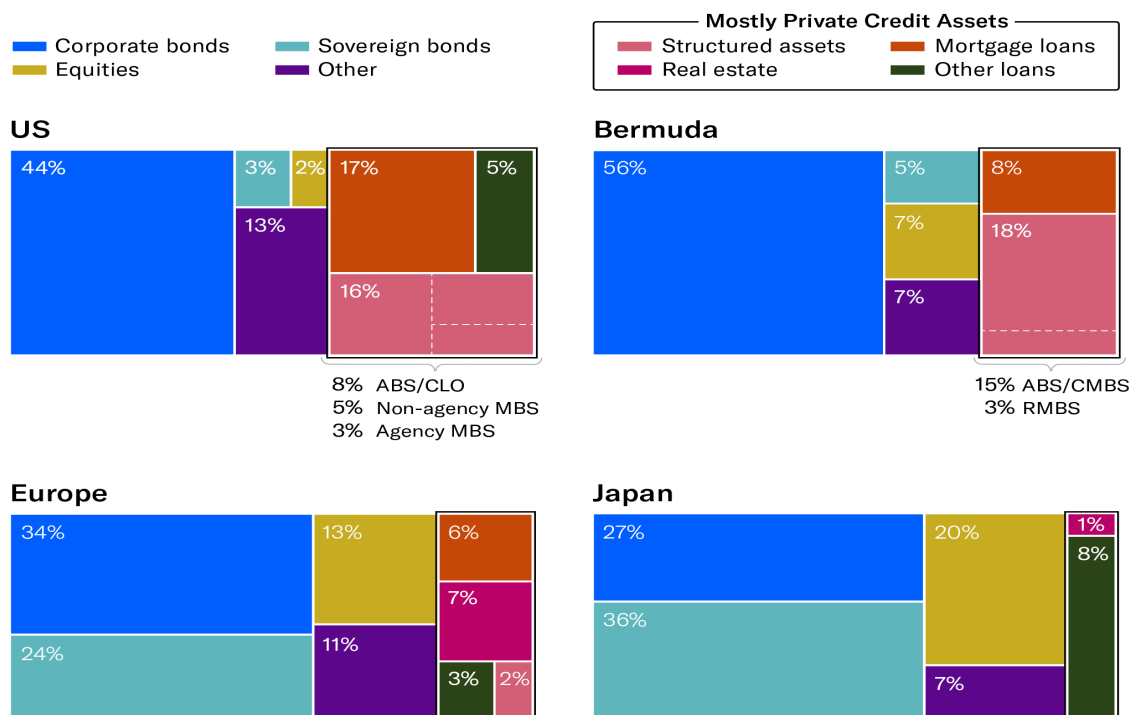


Chart 3.1: Asset allocation in selected regions, long-term insurers, YE 2022

The chart above shows that long-term insurers in Bermuda invest more in corporate bonds compared to insurers in the US, Europe and Japan. The allocation of insurers in Bermuda to illiquid assets is slightly above the allocation of European insurers and significantly lower compared to insurers in the US. On the other hand, allocation to the more volatile asset class Equities is higher in Japan and Europe, compared to Bermuda and the US.

It should be noted that investments in the asset class 'Private Credit Assets', as defined by Moody's for the purposes of the above comparison, do not, by definition, always add

⁴ Source: Moody's In-Depth-Life-Insurance, 15 May 2024



more risk and/or illiquidity to the asset portfolios. Private credit assets could, for example, be very liquid in some cases and also have strong downside (collateral) protection.⁵ These charts show that while long-term insurers invest differently across regions, overall, they hold a comparable mix of liquid assets vs more illiquid assets.

Gaining a deeper insight into the asset mix of Bermuda's long-term insurers is critical for assessing the sector's liquidity risk profile. The following chart 3.2 provides an overview of the asset allocation of Bermuda's long-term insurers at the end of 2023, according to the regulatory filings provided to the BMA.

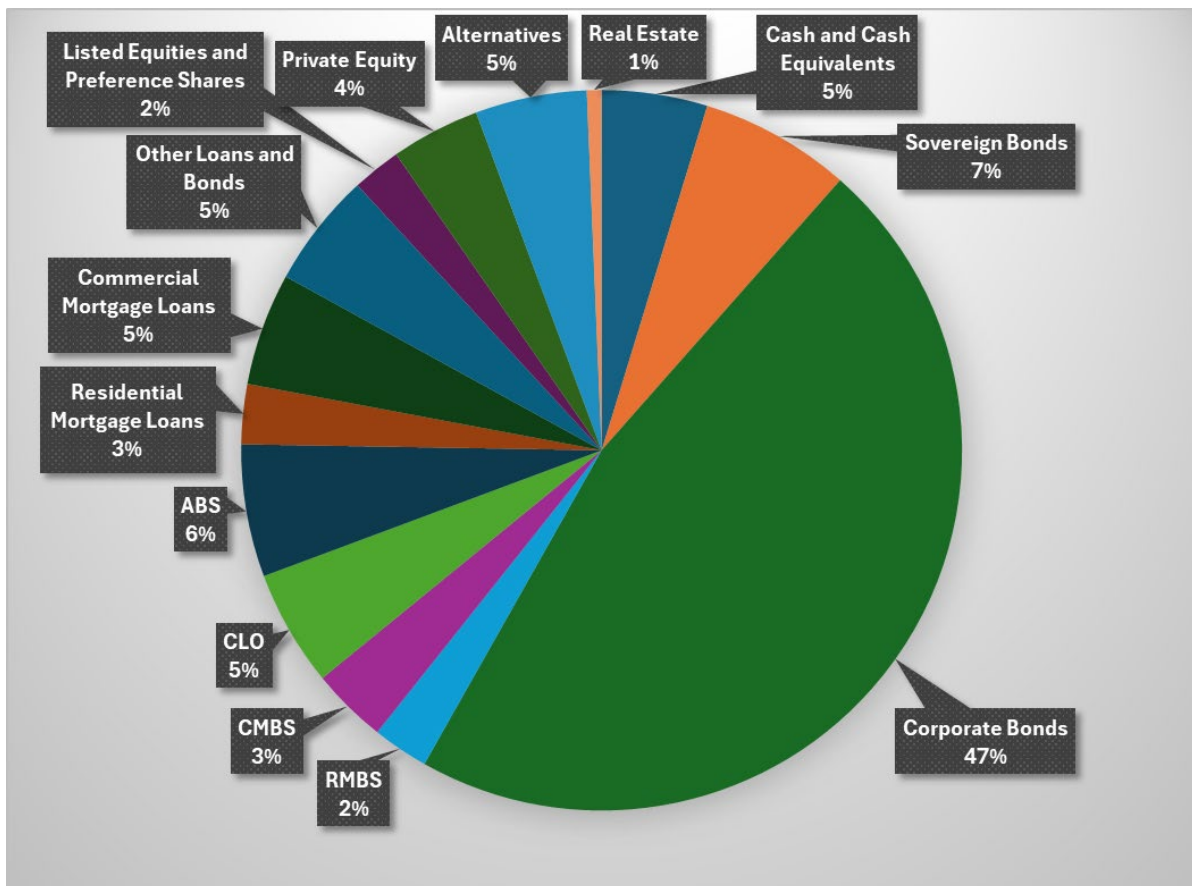


Chart 3.2: Asset allocation, long-term insurers in Bermuda, YE 2023

As can be seen in the chart above, long-term insurers in Bermuda hold a diversified asset mix, with over 60% of their total investments in cash and quoted bonds. The BMA's liquidity management guidelines highlight the importance of liquid, highly-rated assets as essential for sound liquidity management. Therefore, it is insightful to examine the available liquidity sources with consideration of the regulatory requirements regarding permissible assets for defining the liquidity position. This will be discussed in the following paragraph.

⁵ See for more details on private credit that long-term insurers in Bermuda hold, the BMA report "Private Credit - Deep dive on Direct Loans, CLOs, and Private Placements"



3.2 Liquidity Sources

The Authority's mandated stress tests restrict the types of assets that can be utilised in liquidity stress scenarios, along with compulsory haircuts to eligible assets. This is to consider possible liquidity shortages in stress scenarios due to illiquid investments.

The chart below shows the percentage of actual Liquidity Sources by narrowing down to a shorter list of more liquid assets as required by the BMA.

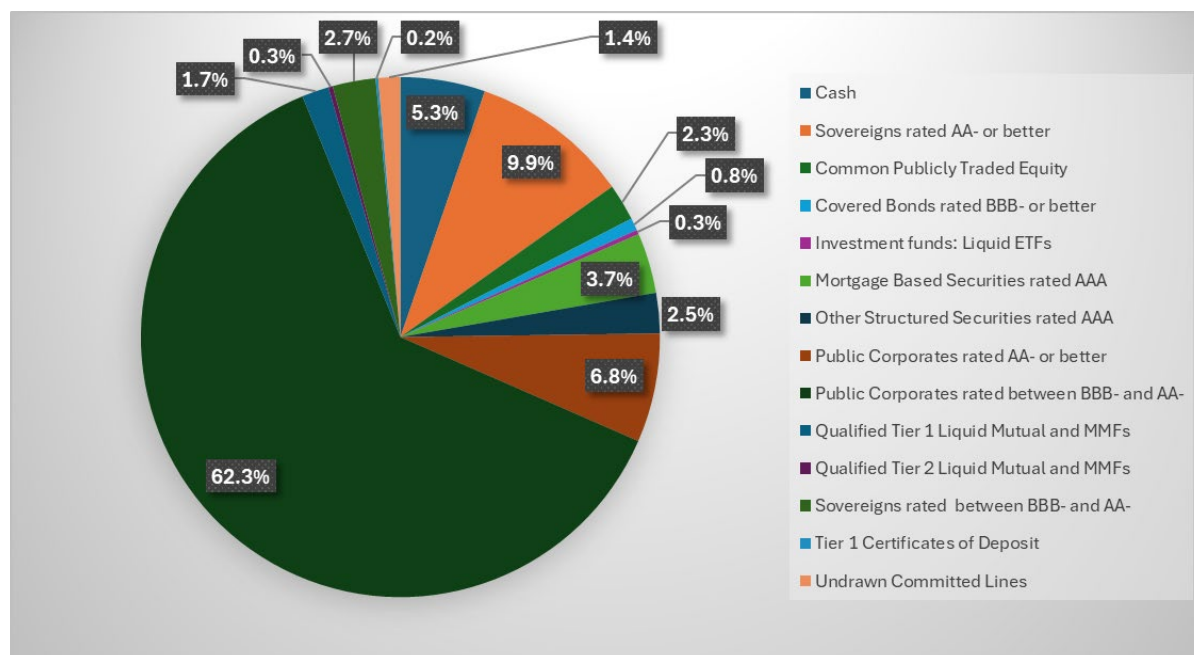


Chart 3.3: Liquidity sources, long-term insurers in Bermuda, YE 2023

As can be seen in chart 3.3, the allocation of Liquidity Sources looks different compared to the total asset allocation of long-term insurers considering the BMA restrictions on eligible assets. For example, while chart 3.2 shows that the total asset allocation to Sovereign bonds is 7%, the contribution of Sovereign bonds rated higher than BBB- rating already accounts for more than 25% of total Liquidity Sources as a result of that some less liquid asset classes are not permitted as Available Liquidity Source by the BMA.

Chart 3.4 below shows the composition of the Liquidity Sources application of all mandatory BMA haircuts⁶ based on a 1-200-year stress event. The haircuts narrow the eligible Liquidity Sources even further by reducing the amount eligible for some less liquid assets. For example, sovereign bonds, covered bonds and corporate bonds with ratings below BBB- are not allowed at all as Liquidity Sources. Bonds with a rating higher than BBB- but below AA- get a higher haircut compared to the bonds rated AA- or better.

⁶ See Appendix for an overview of all BMA mandatory haircuts, both under a 1-20 and 1-200 stress event. These haircuts need to be applied on the assets in the liquidity stress tests. The available Liquidity Sources after haircuts are then compared to the total outgoing cashflows after a mass lapse shock which is further described in the next paragraph.

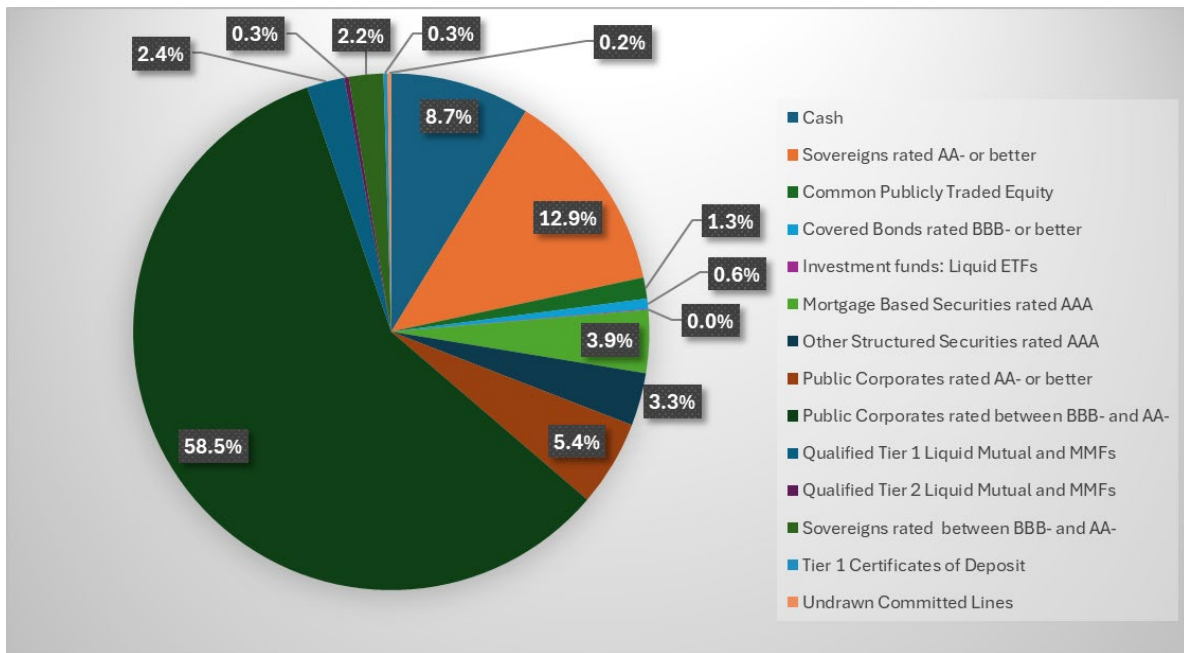


Chart 3.4: Post 1-200 Stress Liquidity sources, long-term insurers in Bermuda, YE 2023

The chart indicates that Bermuda's long-term insurers depend on higher credit-quality liquid assets to satisfy the 1-200-year liquidity stress test. 27% of total Liquidity Sources consist of Cash, and Sovereign and Public Corporate Bonds with a rating of AA- or higher. Investment-grade Public Corporate Bonds, Sovereign Bonds, and Cash make up nearly 90% of the total Liquidity Sources.

The BMA liquidity risk stress tests require the insurers to evaluate their Liquidity Sources in response to a severe liability lapse scenario, which is elaborated upon in the subsequent paragraph.



4. Liabilities and Lapse Stress Tests

In Bermuda, long-term insurers need to conduct regulatory stress tests⁷ tailored both towards assets and liabilities. In addition, they are obligated to carry out extensive liquidity risk stress tests that apply stresses to both assets and liabilities simultaneously. These stress tests consider situations in which policyholders may surrender their policies *en masse* ('mass lapse'), causing substantial cash outflows. For liquidity stress testing purposes, the mass lapse shocks are applied to all lapsable policies, whether lapsing is beneficial for the insurer from a solvency perspective or not. Managing cash outflows as a result of lapses is essential, and insurers must demonstrate that they can withstand severe liquidity stresses while maintaining sufficient liquidity and solvency.

Policyholder behaviour plays a significant role in determining liquidity risk. Factors such as economic conditions, interest rates, competitor rates, and market sentiment can influence policyholder actions, such as lapses and surrenders. Insurers need to continuously monitor these factors and adjust their liquidity management strategies accordingly.

4.1 Impact of Rising Interest Rates

Liquidity risk can emerge with increasing interest rates as policyholders might surrender – above rates expected and assumed in the setting of best estimates – their policies in search of better returns elsewhere, leading to significant cash outflows. In this scenario, asset values could drop at the same time, decreasing further available financial resources. If interest rates increase, for example, bond valuations could decrease. Although the value of liabilities in general also decreases when rates drop, there might be liabilities-driven cash outflows as a result of lapses by policyholders who want to transfer their funds elsewhere. Therefore, it's crucial that stress tests for liquidity risk accurately reflect the interplay between assets and liabilities.

The scenario described above is not a hypothetical scenario, as can be seen in the chart below, which includes the development of the level of surrenders in the Bermuda long-term market over the last few years.

⁷ E.g. interest rate, credit spread, and underwriting risks stress tests

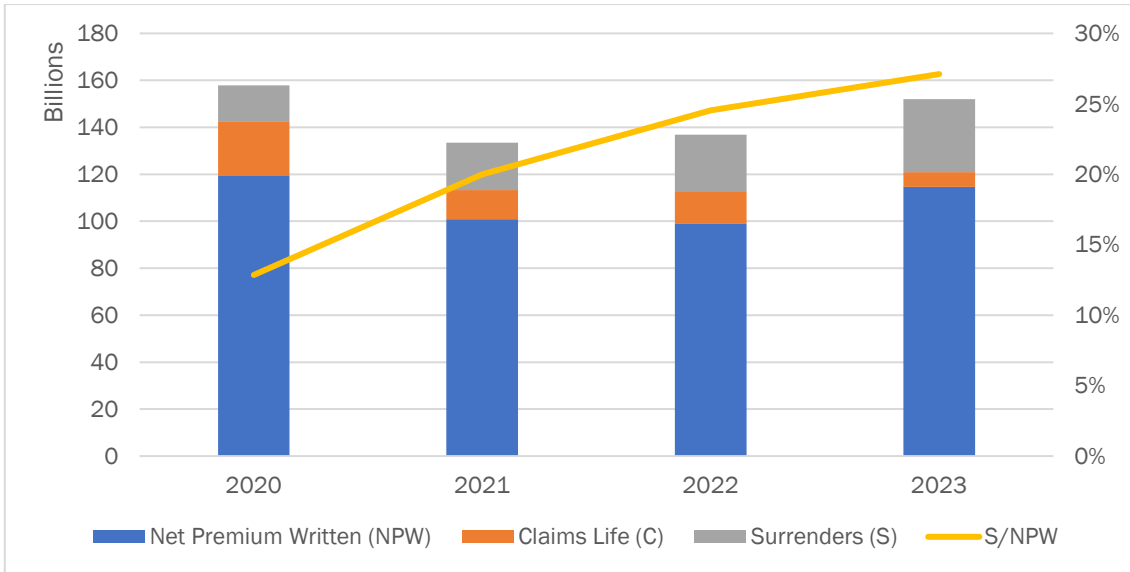


Chart 4.1: Net Premium Written, Claims and Surrenders; Long-term insurers in Bermuda; 2020-2023; NPW, C, and S on left axis; S/NPW on right axis.

Surrender payments as a proportion of the new premium written was trending upwards over the period 2020-2023. This could be attributed to the macroeconomic environment changes over the period. For example, rising interest rates may lead to increases in lapse rates as it may be economically sensible for customers to surrender their policies and invest at higher guaranteed rates. Depending on the proportion of liabilities that can be surrendered, this could pose liquidity challenges for long-term insurers.

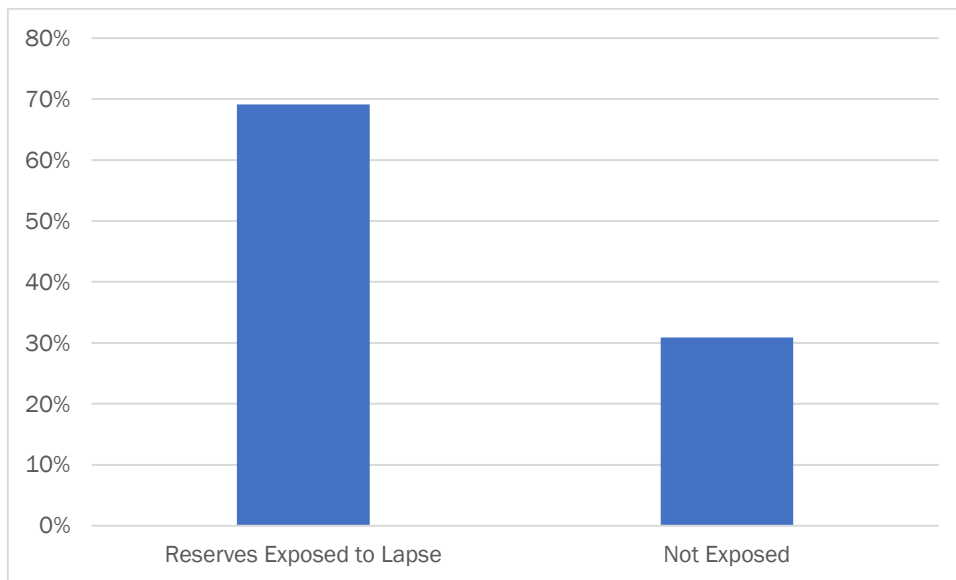


Chart 4.2: Reserves exposed to lapse, long-term insurers in Bermuda, YE2023

Driven by the size of the portion of liabilities that can be lapsed (see chart 4.2 above) and the rapid rise in interest rates over the period 2022 -2023, the BMA conducted a sector-wide survey in 2023 to understand the impacts on the long-term sector. The Authority asked insurers to share data and information relating to lapse experience (including recent and historical data), risk management review of lapses/liquidity, reports submitted to the board, stress testing, summary of policies within two years of the end of the surrender



charge period, and trend in margin calls in the past six months. The conclusions of this survey are summarised below.

- Overall, lapses were observed to increase in 2022, with significant increases observed from Q4 2022 and on an increasing trend into Q1 2023. However, most insurers were able to navigate through this new era of increasing lapse rates as they were mainly within the expected range based on their pricing assumptions
- All insurers perform regular stress testing to monitor their exposure to lapse risk. Also, most insurers report lapse experience to the board on a regular basis (mostly quarterly)
- There was no significant adverse impact of yield volatility on margin calls for derivatives for the insurers that provided data

This survey formed the basis for follow-up targeted reviews at insurance companies including understanding better the specific product features that may cause or mitigate liquidity risk as result of lapses. This is further elaborated on in the next sub paragraph.

4.2 Lapse Risk Mitigation

As part of the BMA liquidity stress tests, companies are required to disclose any contractually agreed level of economic penalty for early surrender imposed by the insurer on policyholders. These penalties include contractual penalties (i.e., surrender charges), which reduce the risk of surrender by policyholders. Higher penalties diminish the incentives for policyholders to pull out funds. Below is a table that delineates the percentage of surrender value according to product group, time restraint, and economic penalty.

Besides economic penalties, time restraints also play a role in surrenders by policyholders. Time restraints are based on the average time between the request by a policyholder and the settlement under the normal course of business. The more quickly policyholders can access their funds, the more likely it is that insurers may have to engage in disruptive fire sales of assets to make the payments promised. The longer the delay, the more opportunities insurers will have to spread the sale of assets over time and/or to access liquidity through other means. In addition, a substantial delay in access may create a disincentive for counterparties to surrender their contracts.

Time Restraint	Low		Medium		High		
Economic penalty	Retail	Institutional	Retail	Institutional	Retail	Institutional	Total
Low	6%	0%	25%	4%	6%	4%	46%
Medium	6%	0%	46%	0%	1%	0%	53%
High	0%	0%	1%	0%	0%	0%	1%
	13%	0%	71%	5%	8%	4%	100%

Table 4.1: Percentage of Cash Surrender Value

	Economic penalty	Time restraint
Low	No economic penalty	less than < 1 week
Medium	less than < 20% economic penalty	between 1 week and < 3 months
High	more than 20% economic penalty	more than > 3 months

Table 4.2: Legend Economic Penalty and Time Restraint

As seen in the table above, more than half of the total surrender value for products that include surrender options, contain a penalty. The data also shows that more than 75% of the total surrender value comes from products that include a time restraint that falls in the category Medium.

The chart below shows data on Economic Penalty by Best Estimate Liabilities (BEL), Cash Surrender Value, and Account value (see Appendix for more detailed definitions).

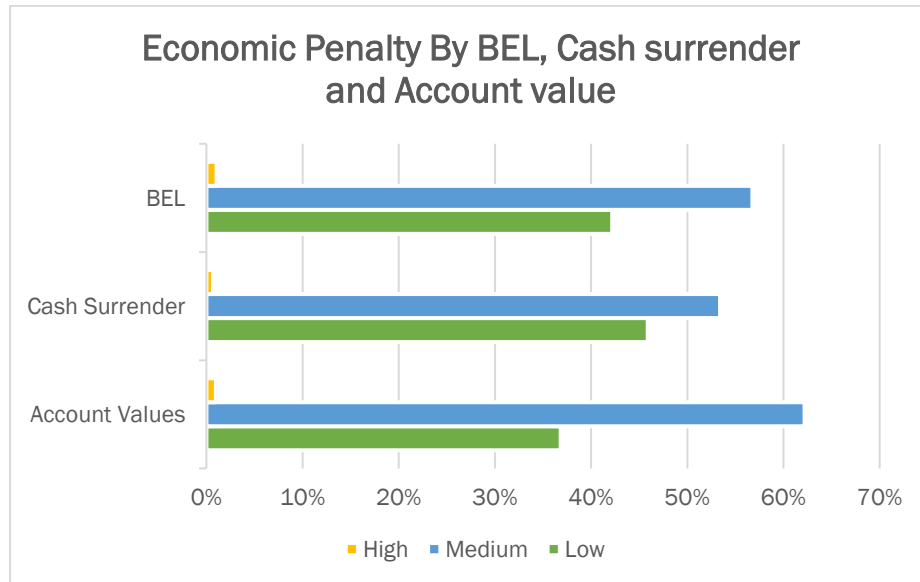


Chart 4.3: Breakdown BEL, Cash Surrender value and Account value by Economic Penalty; Long-term insurers in Bermuda; YE2023

Below is a more detailed breakdown included by BEL. As can be seen, the largest categories measured by BEL are Medium penalty/Medium time restraint, followed by Low penalty/Medium time restraint and Low penalty/High time restraint.

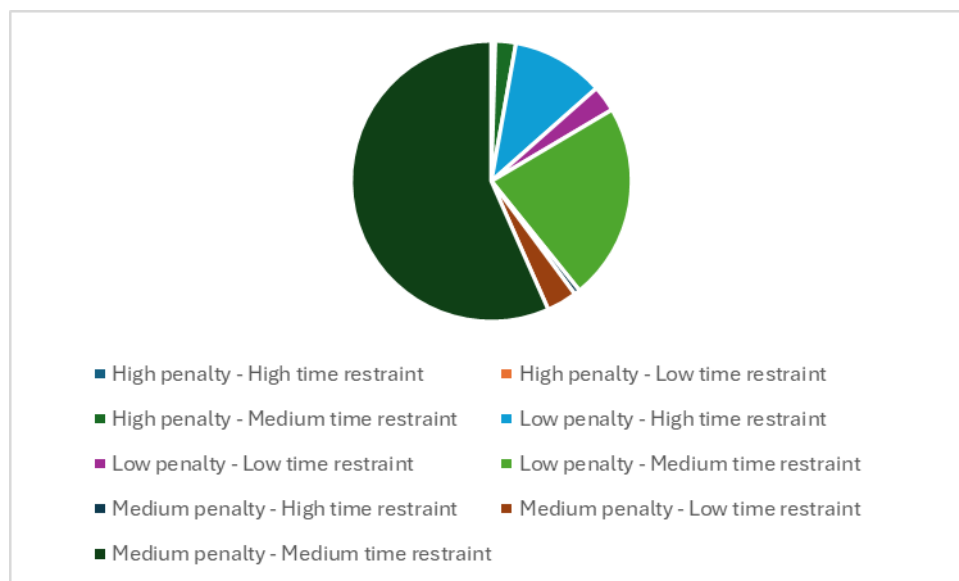


Chart 4.4: Breakdown BEL by Economic Penalty and Time restraint; Long-term insurers in Bermuda; YE2023



In addition to economic penalties, contracts might incorporate other measures inhibiting surrenders. These could include Market Value Adjustments (MVA), which will be described in more detail later in the report, and sanctions applied by third parties, or ones not explicitly detailed within the contract (for instance, tax penalties or other implications tied to taxes).

In general, the BMA points out to insurers that it is prudent to take into account that even a significant economic penalty or any other lapse-mitigating feature in insurance products on its own may not eliminate the risk of surrender because some counterparties may be resistant to financial disincentives (such as during a crisis).

4.3 Liquidity Coverage Ratios

The chart beneath offers a comparison of liquid assets⁸ to the total potential surrender values for long-term insurers in Bermuda. The surrender values are categorised by whether an economic penalty is applied upon surrender by the policyholder. If no economic penalty applies, there is also a further categorisation by the duration until the surrender value becomes available to the policyholder.

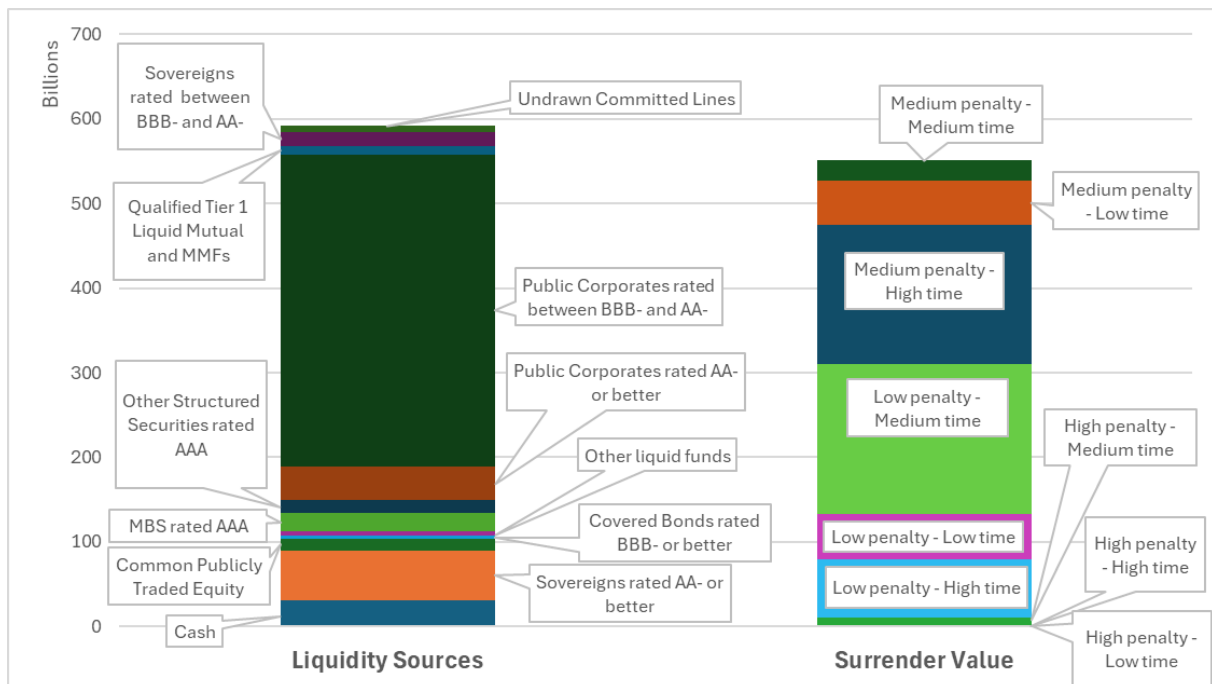


Chart 4.4: Liquidity Sources⁹ vs potential Surrender value; Long-term insurers in Bermuda; YE2023

A comparison between the total surrender potential and liquidity sources¹⁰ is relevant as it shows whether the sector has enough liquid assets to cover the potential surrender

⁸ The category 'Other liquid funds' includes: Investment funds Liquid ETFs, Qualified Tier 2 Liquid Mutual and MMFs, and Tier 1 Certificates of Deposit.

⁹ MBS = Mortgage Backed Securities

¹⁰ Companies are allowed to include instruments as available liquidity sources in a bucket called "Other Liquidity Sources". This category is left out of this comparison to provide a prudent comparison between Liquidity Sources and Surrender value.



value¹¹. If the amount of liquidity sources is lower than the surrender potential, illiquid assets might be needed for liquidity purposes, and these assets may have to be sold at a discount if needed within a short timeframe. According to chart 4.4, Bermuda's long-term insurers hold sufficient liquid assets to handle a sudden 100% lapse shock (i.e. if all policies that can be lapsed also are lapsed), with their liquid assets averaging 7% greater than the surrender values. This shows a very liquid base position, i.e. in the base scenario there is sufficient liquidity to cover the total surrender values for all liabilities, including lapse options for the total Bermuda long-term market. It should, however, be noted that the comparison above is based on the total long-term sector. An individual's situation can be very different, which is further explored later in this paragraph.

For reference, the following is a chart from a recent report published by the Bank for International Settlements¹² that provides comparable data for different jurisdictions across the globe. This chart shows the liquid assets versus potential surrender value across various jurisdictions. It is evident from the chart that for all jurisdictions included, the total potential surrender value is slightly or significantly greater than the liquid assets. This emphasises the point earlier made on that regulators across the globe need to cooperate together to ensure long-term insurers implement robust liquidity risk frameworks that ensure sufficient liquidity, taking into account their liability profiles.

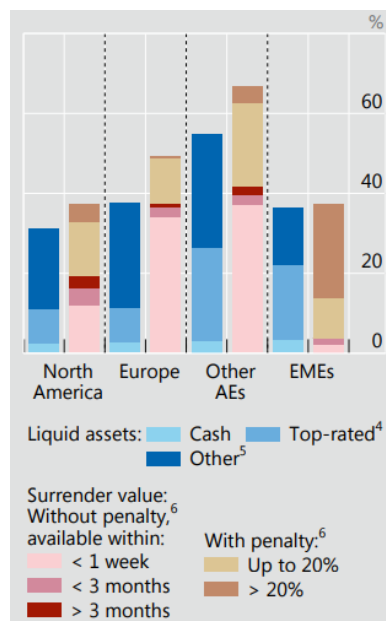


Chart 4.5¹³: Liquid assets vs surrender potential at major insurers in selected geographies¹⁴

As mentioned, chart 4.4 on the Bermuda long-term market presents an overall prudent liquidity position, even in the theoretical extreme scenario that all lapsable policies are lapsed simultaneously. It is, however, unrealistic to assume that all policies that can be lapsed will also be lapsed at the same time. Also, some assets may not be able to be sold

¹¹ See table 4.2 with explanation of different Surrender value categories included in the chart.

¹² BIS Annual Economic Report 2024

¹³ Legend: *4 Highest-quality sovereign and supranational securities. *5 Includes high-quality public and private debt, liquid stocks, certificates of deposits and liquid fund shares. *6 Economic penalty as defined in the insurance contract.

¹⁴ Based on data from International Association of Insurance Supervisors, Individual Insurance Monitoring data as of end-2022.



at current value. In the BMA liquidity stress tests, this is considered by assuming a severe mass lapse event and at the same time, decreased asset values, particularly for the less liquid assets. In this stress tests, the available liquidity after stress is then compared to the cash surrender value.

In the assessment, assets are subjected to stress scenarios considering a 1-in-20 and 1-in-200 event/haircut, while liabilities undergo a mass lapse shock. These shocks are applied to the surrender values. The mass lapse shock takes into account if there are no risk-mitigating features in the products underlying the surrender values; the lower the time restraint and/or economic penalty is, the higher the mass lapse shock is. The Liquidity Sources available after stress are divided by the total surrender outflow in a mass lapse shock, giving the Liquidity Coverage Ratio (LCR).

The LCR results for Year End 2023 reporting¹⁵ are depicted in chart 4.6 below.

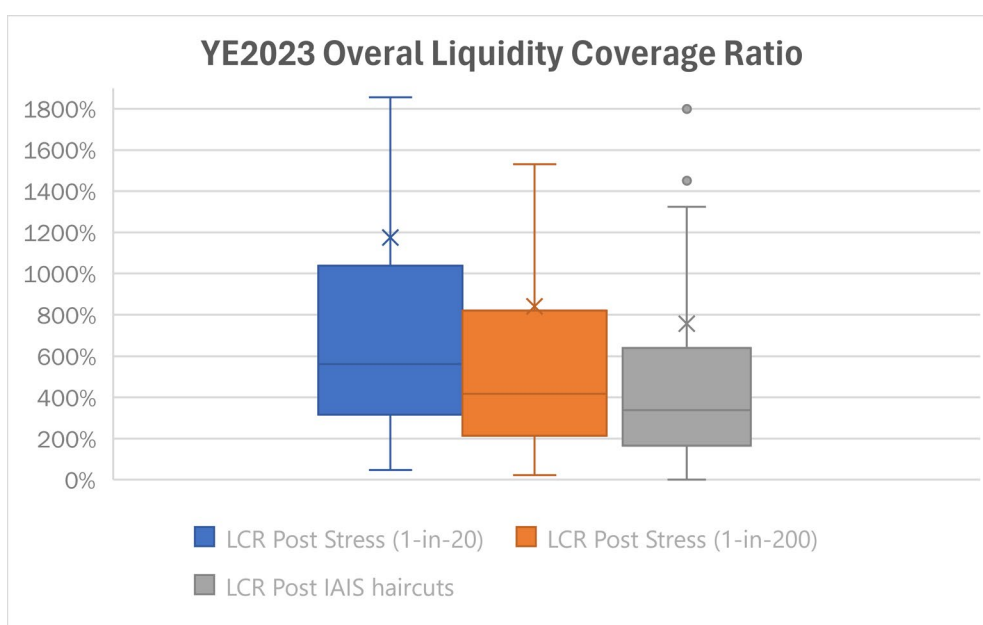


Chart 4.6: Distribution Liquidity Coverage ratio; Long-term insurers in Bermuda; YE2023

The weighted average and median¹⁶ LCR post stress are shown in the table below:

LCR post stress	1 in 20	1 in 200
Weighted Average	1009%	527%
Median	562%	418%

The LCR stress tests show that long-term insurers in Bermuda hold a sufficient amount of liquid assets, which can be used to meet liquidity needs from cash surrenders. The results of the liquidity stress tests show that insurers have, on average, sufficient liquidity post-stress under the 1-in-20 and 1-in-200 scenarios. From a solvency perspective, for companies where the stress scenarios are relevant, 95% of them remain with an ECR ratio above 100% under the 1-in-20 scenario and 88% under the 1-in-200 scenario. This

¹⁵ The review of YE2023 filings including LCR data is ongoing and may still undergo minor modifications.

¹⁶ Outliers with very high liquidity ratios were excluded.



demonstrates, overall, that the long-term sector is resilient against the prescribed liquidity shocks.

The results above are based on the BMA regulatory liquidity stress tests that long-term insurers must report to the BMA on a regular basis. The stress test involves a surrender stress with also, at the same time, assets decreasing in value. For the latter, as explained earlier in the report, mandatory haircuts need to be applied to the assets on the insurer's balance sheet. For the sake of comparison, in the same chart 4.6 above are the results included for the long-term sector if the IAIS haircuts¹⁷ are applied instead of the BMA haircuts. The results show that the LCR drops when the IAIS haircuts are applied. The average and median remain however significantly above the minimum LCR of 105%.

The weighted average and median¹⁸ LCR post-stress, including IAIS haircuts, are shown in the table below:

LCR post stress	1 in 200
Weighted Average	526%
Median	360%

While the overall long-term sector in Bermuda shows strong resilience against liquidity shocks, some insurers show liquidity shortages under the stress scenarios. The BMA engages with the management of these companies to ensure adequate risk mitigation measures. This is achieved through company-specific deep dives as well as targeted sector-wide assessments and the CISSA process (refer to paragraph 2.3 for additional information).

4.4 Bermuda Long-term Market-Specific Features

The Bermuda insurance industry's relative resilience against liquidity stress could likely be attributed to some specific features in the liability structure of Bermuda's long-term insurers. The particular attributes of insurance products are crucial in assessing their inherent liquidity risk. Characteristics such as surrender charges can greatly impact the chance of policy surrenders, which has implications for liquidity risk on an individual product basis.

The majority of the overall liabilities of the Bermuda companies are reinsured liabilities of US insurers, often featuring products with significant surrender penalties. These penalties, which are often hefty initially and gradually downgraded, discourage policyholders from surrendering their policies during the surrender charge period, leading to more stable liabilities.

Nevertheless, long-term insurers must recognise that these risk-mitigating aspects of liabilities might diminish over time. For instance, the benefits a policyholder gains from lapse could offset economic sanctions. Additionally, with proactive communication from independent brokers who advise policyholders when surrendering is advantageous, there may be an increase in surrenders despite any penalties. This scenario becomes

¹⁷ IAIS, Level 2 document Liquidity Metrics as an ancillary indicator, 18 November 2022

¹⁸ Outliers with very high liquidity ratios were excluded.



particularly risky in an environment with higher rates, heightening competitive pressures within the savings market.

The current market opportunities could stem from aggressive brokerage activities accentuated by the present increased interest rates. Even policies subject to greater surrender charges in their initial periods might face lapses, as the attractiveness of new offerings in the market might convince policyholders to surrender their current contracts. This tendency questions the traditional dependence on surrender charges to prevent policy lapses.

It's vital for insurers to regularly review lapse rates as part of their liquidity risk management, including receiving timely updates from cedents and more closely monitoring sizable contracts that potentially require significant liquidity upon surrender. They should also enhance their contingency plans for sustained high lapse rates, re-evaluate actuarial assumptions to avert possible under-reserving and ensure they hold enough liquid assets to meet their obligations through short-term and long-term liquidity cash flow projections under base and stressed scenarios.

The products underlying the liabilities of reinsured US-originated liabilities also often include the previously mentioned Market Value Adjustment (MVA). In essence, the MVA implies that as interest rates go up, the surrender value goes down. In broad terms, this aspect could deter policy surrenders in a climate of increasing interest rates.¹⁹ MVAs also facilitate Asset & Liability Management (ALM) matching and mitigate liquidity risk because the decline in surrender value can help offset the decline in fixed-rate asset value as rates increase.

Finally, insurers in Bermuda typically have a higher proportion of reinsurance liabilities. There's often a delay between policy surrenders and when primary insurers must pay surrender values to policyholders. This delay may be even longer for reinsurers, who usually settle accounts quarterly as per their contracts. This extra time allows reinsurers to manage their liquidity more effectively than primary insurers, reducing the urgency to liquidate assets hastily, potentially below fair value, to meet liquidity demands.

¹⁹ Although it should be noted that, conversely, the MVA could also have the opposite impact when rates go down - as was seen e.g. during the financial crisis, when the MVA effectively offset (parts of) the surrender charges for some products.

5. Conclusions

This report highlights the resilience of Bermuda's long-term insurance sector against liquidity-related shocks in the current volatile global environment. The long-term insurance industry in Bermuda has demonstrated robustness against the recent stress of quickly increasing interest rates and liquidity risk due to a mix of product structure, investment diversification, solid regulatory liquidity risk framework, and strong asset & liability management and liquidity risk management.

Despite this resilience shown over the last few years, long-term insurers in Bermuda continue to enhance their liquidity risk management processes, particularly amidst increasing policy lapses, as shown in the data from this report, a trend induced by current market dynamics. The characteristics of Bermuda's long-term insurance products and the asset allocation data presented in this report reveal that long-term insurers in Bermuda have a diverse range of assets and liability profiles. Because of these differences in portfolio features, current regulatory standard stress tests may not always fully capture all sources of liquidity risks the companies may have. Consequently, the BMA continues to engage with the long-term sector on the outcomes of their tailored liquidity stress tests included in the CISSAs.

The gathered data highlights the need for long-term insurers to monitor lapse rates closely, as well as from the perspective of their liquidity risk management programs. Reinsurers might have to get updates more often from ceding companies about any shifts in lapse behaviour from the underlying contracts. On the assets side, long-term insurers should run tailored stress tests to review if they have enough liquid resources to fulfil their obligations by projecting liquidity cash flows for both the immediate and near future under base and stress scenarios. Liquidity Stress Tests were included in the annual mandatory filings for the first time for year-end 2023 reporting. The BMA is considering further refinements to the stress tests based on lessons learnt from the year-end 2023 reporting and feedback received from the market.

The BMA is committed to ensuring that long-term insurers maintain robust liquidity risk management practices within its jurisdiction. This allows long-term insurers with strong ALM capabilities and an infrastructure in place to assess the risks in illiquid assets, to continue to invest in assets that provide stable and predictable cash flows to match their long-term liabilities. Through the recently introduced stringent regulatory requirements and continuous oversight, the BMA supports a stable and resilient life insurance market in Bermuda, capable of withstanding both asset and liability-driven liquidity shocks. The findings included in this report reaffirm that Bermuda's long-term insurers are well-prepared to navigate liquidity challenges, safeguard policyholder interests and maintain market stability.

Appendix

A. Glossary of Terms

- **Account value:** The Account Values of the policy groups are as reported under local GAAPs.
- **ALM:** Asset Liability Management
- **Cash Surrender Value:** The cash surrender value is defined as the amount that would be paid out if a policy was surrendered immediately in the event of a mass lapse shock– i.e., the cash surrender values include the impact of surrender charges and MVA's where applicable. This includes all products that are exposed to lapse risk, i.e., all lapse-sensitive and lapse-supported products.
- **CISSA:** Commercial Insurer's Solvency Self-Assessment required on an individual insurer basis
- **Economic penalty:** Economic penalty only includes contractual penalties (i.e., surrender charges) imposed by the insurer on policyholders that surrender early. It does not include MVA, as these can encourage surrenders depending on circumstances. It also does not include penalties that are imposed by third parties or are not explicitly quantified in the contract, such as the economic value of foregone benefits (e.g., tax penalties or other tax implications).
- **ECR:** Enhanced Capital Requirements
- **GSSA:** Group Solvency Self-Assessment on a group basis where the BMA is the Group Supervisor
- **IAIS:** International Association of Insurance Supervisors
- **ICS:** Insurance Capital Standard
- **Institutional:** means policies where the policyholder is not a retail customer (e.g., a corporation or institution). In the case of the reinsurance business, the classification of a policy as retail or institutional should be based on the original policyholder (the one that holds the policy issued by the direct writer), not on the cedent. As such, reinsurance contracts are not automatically classified as institutional contracts.
- **Liquidity Coverage Ratio:** Liquidity sources divided by potential surrender value as a result of a mass lapse scenario
- **LT:** Long-term
- **Retail:** means policies where the policyholder is a retail customer.
- **Time restraints:** Time restraints are based on the average time between the request by a policyholder and the settlement under the normal course of business.

B. BMA and IAIS LCR Asset Haircuts

BMA LCR Asset Haircuts²⁰

Liquidity Source Type	Haircut	1 in 20 yield shock	1 in 200 yield shock
Cash	0%		
Common Publicly Traded Equity	65%		
Tier 1 Certificates of Deposit	5%		
Tier 2 Certificates of Deposit	10%		
Tier 3 Certificates of Deposit	60%		
Undrawn Committed Lines	90%		
Qualified Tier 1 Liquid Mutual and MMFs	15%		
Qualified Tier 2 Liquid Mutual and MMFs	40%		
Qualified Tier 3 Liquid Mutual and MMFs	85%		
Investment funds: Liquid ETFs	90%		
All Other Potential Liquidity Sources	100%		
Public Corporates rated AA- or better		1.20%	2.90%
Public Corporates rated between BBB- and AA-		1.30%	3.00%
Sovereigns rated AA- or better		0.60%	1.20%
Sovereigns rated between BBB- and AA-		1.20%	2.40%
Covered Bonds rated BBB- or better		1.20%	2.65%
Mortgage Based Securities rated AAA		1.70%	3.10%
Other Structured Securities rated AAA		2.00%	3.80%

²⁰ See 2023 BSCR reporting Class C, D and E Models on www.bma.bm/document-centre/reporting-forms-and-guidelines-insurance

IAIS Insurance Liquidity Ratio (ILR) Liquidity Sources – Factors 2022 for 1Y and 3M time horizons²¹

Factors 3M time horizon	Factors 1Y time horizon	Liquidity Sources
100%	100%	Cash
95%	100%	Sovereigns rated AA- and above
95%	100%	Sovereigns in local currency
75%	85%	Sovereigns rated A- and above
60%	70%	Sovereigns rated BBB- and above
75%	85%	GSE securities senior to preferred shares rated above A-
50%	70%	Investment-grade covered bonds
60%	70%	Investment-grade PSE debt
50%	70%	Non-financials: Investment-grade corporate debt securities
40%	50%	Non-financials: Common equity
40%	50%	Financials: Investment-grade corporate debt securities
30%	40%	Financials: Common equity
40%	50%	Certificates of Deposit
10%	10%	Undrawn committed lines
15%	25%	Investment funds: Liquid mutual and MMFs
10%	25%	Investment funds: Liquid ETFs
20%	85%	Non-life net earned premiums in the last year

²¹ IAIS Liquidity Metrics as an ancillary indicator, 18 November 2022

