NATIONAL ASSOCIATION OF
INSURANCE COMMISSIONERS

NAIC 2022 LIQUIDITY STRESS TEST FRAMEWORK
For Life Insurers Meeting the Scope Criteria

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INTRODUCTION

Macroprudential Implications of a Liquidity Stress

Beginning mid-year 2017, the NAIC embarked on a project to develop a liquidity stress testing framework. While the NAIC has existing tools and processes for assessing liquidity risk at a legal entity level (i.e., 'inward' impacts to the insurer), there was recognition that the NAIC toolbox could be further enhanced with the addition of more granular data in the annual statement and a tool that would enable an assessment of macroprudential impacts on the broader financial markets (i.e., 'outward' impacts) of a liquidity stress impacting a large number of insurers simultaneously.

Post-financial crisis, there were several attempts to assess potential market impacts emanating from a liquidity stress in the insurance sector. Many of these analyses relied heavily on anecdotal assumptions and observations from behaviors of other financial sectors. To provide more evidence-based analyses, the NAIC decided to develop a Liquidity Stress Test (LST) Framework for large life insurers that would aim to capture the outward impacts on the broader financial markets of aggregate asset sales under a liquidity stress.

The stress test will be run annually and the findings, on an aggregate basis, reported annually as part of the NAIC's continuous macroprudential monitoring efforts. The NAIC's pursuit of the liquidity stress test should not suggest any pre-judgement of the outcomes. The NAIC believes there is value to the exercise whether it points to vulnerabilities of certain asset classes or markets or, alternatively, suggests that even a severe liquidity stress impacting the insurance sector is unlikely to have material impacts on financial markets. The NAIC liquidity stress testing framework is intended to supplement, not replace, a firm-specific liquidity risk management framework. The NAIC has not yet discussed steps that might be taken to address any identified vulnerabilities but acknowledges that any recommendations may require collaboration with other financial regulators.

The NAIC's revised proposed liquidity stress testing framework is contained in the pages that follow. The NAIC recognizes that, at least in the early years, the stress testing process and analyses will be iterative. We expect refinements as the framework is developed, especially after the first year's implementation.

BACKGROUND

NAIC Macroprudential Initiative

The NAIC's Macroprudential Initiative (MPI) commenced in 2017. It recognized the post-financial crisis reforms that became part of our Solvency Modernization Initiative (SMI) that continue to serve us well today. However, in the ensuing years since those reforms, insurers have had to contend with sustained low interest rates, changing demographics and rapid advancements in communication and technology. They have responded by offering new products, adjusting investment strategies, making structural changes, and expanding into new global markets. There are new market players, new distribution channels, and a complex web of interconnections between financial market players.

What has not changed since the financial crisis is the scrutiny on the insurance sector in terms of understanding how insurers react to financial stress, and how that reaction can impact, via various transmission channels, policyholders, other insurers, financial market participants, and the broader public.

The proposed work on macroprudential measures is reflective of the state insurance regulators' commitment to ensure that the companies they regulate remain financially strong for the protection of policyholders, while serving as a stabilizing force to contribute to financial stability, including in stressed financial markets. To that end, the NAIC's three-year strategic plan (2018-2020), "State Ahead", reflects the objective of "Evaluating Gaps and regulatory opportunities arising from macroprudential surveillance, and develop appropriate regulatory responses."

The NAIC's work on macroprudential surveillance is overseen by the Financial Stability Task Force of the NAIC Executive Committee. In April 2017, the Task Force was asked to consider new and improved tools to better monitor and respond to both the impact of external financial and

economic risks on supervised firms, as well as the risks emanating from or amplified by these firms that might be transmitted externally. The Task Force, in turn, focused its efforts on potential enhancements to identify and monitor liquidity risk, among other areas. More specifically, the Task Force was requested to further develop the U.S. regulatory framework on liquidity risk with a focus on life insurers due to the long-term cash-buildup involved in many life insurance contracts and the potential for large scale liquidation of assets.

Liquidity Assessment Subgroup

To carry out its work on assessing liquidity considerations, the Task Force established the Liquidity Assessment Subgroup ("Subgroup") mid-year 2017.

Mandate

The charges and workplan of the Subgroup reflect the following assignments:

- Review existing public and regulator-only data related to liquidity risk, identify any gaps based on regulatory needs and determine the scope of application, and propose recommendations to enhance disclosures.
- Develop a liquidity stress testing framework proposal for consideration by the Financial Condition (E) Committee, including the proposed universe of companies to which the framework will apply (e.g., large life insurers).
- Once the stress testing framework is completed, consider potential further enhancements or additional disclosures.

In addition, a small informal study group comprised of regulators, industry participants and NAIC staff was formed to consider the specific data needs and technical aspects of the project. The study group is NOT an official NAIC working group. All recommendations from the study group must be vetted and considered by the Liquidity Assessment Subgroup and/or the Financial Stability (EX) Task Force according to NAIC procedures.

Data Gaps

Prior to undertaking work on the Liquidity Stress Test, the Subgroup constructed an inventory list of existing life insurer disclosures as of 2018 that contribute to an understanding of liquidity risk.

When assessing the current state, the Subgroup recognized the availability of significant detailed investment-related disclosures but contrasted it to the relatively sparse liability-related disclosures. To remedy this imbalance, a blanks proposal was constructed to significantly increase the disclosures for life insurance products.

Specifically, the Analysis of Operations by Line of Business schedule was expanded from a single exhibit to five exhibits, one each for Individual Life, Group Life, Individual Annuity, Group Annuity, and Accident and Health. The Analysis of Increase in Reserves schedule was similarly expanded. Within each of the five new exhibits, columns were added for more detailed product reporting. For example, columns were added to the Individual and Group Life exhibits to capture universal life insurance and universal life insurance with secondary guarantees, and columns were added to the Individual and Group Annuity exhibits to capture variable annuities and variable annuities with guaranteed benefits. In addition, two new lines were added to the now five exhibits of the Analysis of Increase in Reserves schedule: one capturing the cash surrender value of the products outstanding and another capturing the amount of policy loans available (less amounts already loaned). A new addition was also proposed to the Life Notes to Financial Statement. The new Note 33 considered the type of liquidity concerns disclosed in Note 32 for annuities and deposit-type contracts and added disclosures for life insurance products not covered in Note 32.

These proposals were exposed and commented upon several times at the Liquidity Assessment Subgroup, the Financial Stability (EX) Task Force, and at the Blanks (E) Working Group. Ultimately, they were adopted by NAIC Plenary for inclusion in the 2019 Life Annual Statement Blank. As an interim step, The Financial Stability Task Force performed a data call requesting a few key lines of information from the newly adopted 2019 format of the Analysis of Operations by Line of Business schedule and the Analysis of Increase in Reserves schedule, as well as the new Note 33, but populated with 2018 year-end data. This data call was completed in July 2019.

Discussions with Insurers

During the latter part of 2017 and first quarter of 2018, the Subgroup conducted calls with several large life insurers who agreed to share their internal liquidity risk assessment processes. The

dialogue provided extremely helpful input and informed the establishment of the initial direction of the Liquidity Stress Testing Framework. Feedback from these discussions include:

- Scope criteria should be risk-focused, not solely based on size.
- Stress test framework should align with internal management reporting and leverage the ORSA.
- Stress test should be principle-based and complement a company's internal stress testing methodology.
- Regulatory guidance should be provided to help define liquidity sources and uses, products/activities with liquidity risk, time horizons, level of aggregation, reporting frequency, and establishing stress scenarios.
- Public disclosure of results should be carefully considered to avoid exacerbating a liquidity crisis.

Regarding the specifics of liquidity assessments/stress test approaches, significant diversity in practices exist. Key observations in this regard included:

- Liquidity tests are performed at the material entity level and at the holding company level. Definitions of material entities differ.
- Most firms determine some sort of coverage ratio (Liquidity Sources) / (Liquidity Uses), for Base and Stress scenarios and monitor results to ensure they align with the firm's (internal) risk appetite. Categories of liquidity sources and uses differ across firms and assumptions vary depending on time horizon. Some insurers determine coverage ratios utilizing balance sheet values, applying different haircuts by asset class, time horizon and type of stress. Other insurers determine liquidity coverage gaps (Liquidity Inflows – Liquidity Outflows) utilizing a cash flow approach.
- Stress scenarios vary by company, reflecting a combination of market-driven, as well as idiosyncratic and insurer-specific scenarios.
- Time horizons tested also vary, typically ranging from 7 days to 1 year.

Regulatory Goals of the Liquidity Stress Test

- The primary goal of this liquidity stress testing, and the specific stress scenarios utilized, is for macroprudential uses – to allow the FSTF regulators to identify amounts of asset sales by insurers that could impact the markets under stressed environments. Thus, the selected stress scenarios are consciously focused on industry-wide stresses – those that can impact many insurers within a similar timeframe. These may not be the most stressful scenarios for specific legal entity insurers, or even their groups. Regulators have indicated the liquidity stress testing is also meant to assist regulators in their micro prudential supervision, in the context of being helpful for domiciliary and lead state regulators to better understand liquidity stress testing programs at those legal entities and groups. There is no intent to require these stress scenarios to be used by individual insurers for some sort of assessment or regulatory intervention mechanism. Similarly, there has not been any consideration given to requiring them in the management of any entities in receivership.
- Regulatory concerns regarding liquidity risk for legal entity insurers and/or groups is more about the stress scenarios of most concern to those entities (not those identified for macro prudential purposes). Similarly, when considering liquidity risk at a legal entity and/or group, regulators need to understand the insurer's entire risk management framework. Much of this understanding may come from the ORSA filings. Thus, the LST is not meant to be a legal entity insurer requirement, or used as a ranking tool, etc. However, it is recognized that simply reviewing these LST results may help regulators better understand the role of liquidity stress testing within the entities – which may result in more questions and information requests regarding the entities' own liquidity risk management framework and dynamics of their internal liquidity stress tests.

[Beginning of] 2022 Liquidity Stress Testing Framework – to be included/referenced in the NAIC Financial Analysis Handbook

Section 1. Scope Criteria for Determining Groups Subject to 2022 LST

HISTORY – Scope Criteria for the Initial 2020 LST:

In determining the companies subject to the liquidity stress test (LST), consideration was given to activities assumed to be correlated with liquidity risk. Another consideration was the desirability of tying data used in the criteria back to the statutory financial statements. Ultimately six activities were identified. Those activities are Fixed and Indexed Annuities, Funding Agreements, Derivatives, Securities Lending, Repurchase Agreements and Borrowed Money. Minimum thresholds were established for each of these six activities. A life insurance legal entity or life insurance group exceeding the threshold for any of the six activities is subject to the stress test (see Annex 1 for more details).

While the scope criteria only utilize statutory annual statement data, the stress test is not similarly limited. Thus, the stress test will consider many more liquidity risk elements than the scope criteria, and internal company data will be the source for many of those elements.

Just as the liquidity stress test structure and methodology may change over time, the scope criteria may also be modified, for example, in response to new data points in the NAIC Annual Statement Blank. The scope criteria will be reviewed annually.

Using the agreed criteria, NAIC staff obtained the amounts for all life insurance legal entities from the 2018 annual statutory financial statements (filed by March 1, 2019). If two or more life insurers were part of an insurance group with an NAIC group code, then the numbers for each of those legal entity life insurers was summed together to represent an insurance group result. Thus, a legal entity life insurer not in an insurance group can meet the threshold on its own, or the sum of legal entity life insurers in a group could meet the threshold. Twenty-three insurance groups met the initial scope criteria.

In establishing whether an insurer or group met or exceeded the threshold criteria, the Subgroup members supported using the most current single year activity rather than a multi-year average. This resulted in coverage amounts ranging from 60% to 80% of the industry total for each activity based on 2018 data. It was recognized that using single year activity could result in more instances of an insurance group being in scope one year and out of scope the next, but regulators viewed it more important to have the most recent financial data utilized for determining scope. To address concerns about insurers moving in and out of scope, regulatory judgment will be used

to address an insurer's exit from or entry to the scope of insurers subject to the liquidity stress test. Per revisions to the model Holding Company Act, the lead state regulator will consult with the Task Force in determining when it is appropriate to remove an insurer from the LST requirement if it no longer meets the scope criteria. Similarly, lead state regulators should have the ability to consult with the Task Force and require the LST from an insurer not meeting the scope criteria (e.g., an insurer close to triggering the scope criteria for more than one year).

CURRENT – Scope Criteria for the 2022 LST:

Regulators agreed to retain the same 6 criteria and thresholds from the 2020 and 2021 LST Scope Criteria for use as the 2022 LST Scope Criteria. The 2022 LST Scope Criteria have been applied to the 2021 annual statement data (data as of Dec. 31, 2021, filed by March 1, 2022).

Section 2. Liquidity Stress Test

2.1 Summary

The stress testing framework employs a company cash flow projection approach incorporating liquidity sources and uses over various time horizons under a baseline assumption and some number of stress scenarios (for 2022 there are 2 stress scenarios and also an insurer-specific request for information). The available assets are then recorded by asset category. The framework then calls for identification of expected asset sales by category, or other funding as allowed in the stress test, to cure any cash flow deficits (liquidity uses exceed liquidity sources) under the stress scenarios. The stress tests are to be performed at the legal entity level; the aggregated group does not perform the LST.

2.2 Time Horizons

The time horizons chosen by regulators are 30 days, 90 days, and 1 year, because, overall, insurance products are designed to be for the benefit of customers as risk protection over the long term and not designed to provide short term liquidity like other financial products. Historical experience in times of stress demonstrate slow policyholder reaction in short periods of time, as opposed to an event that occurs over months or years. Features designed to protect the long-term nature of the product for the policyholders ultimately reduce the likelihood of policyholder

reaction to short-term volatility in markets. Therefore, evaluating shorter than 30-day time horizons has been deemed not warranted for the overarching macroprudential purpose of gauging liquidity risk in the Life insurance industry.

Policyholders do not "run" from an insurer in times of economic stress to the extent depositors do from a bank, because insurance is purchased to obtain the protection insurance provides, not as a source of liquidity or discretionary funds. In the United States, life insurance and annuities are purchased primarily for long-term financial protections upon death or retirement. Surrendering a life insurance contract to harvest its cash surrender value would leave the policyholder without death benefit protection that would be expensive or impossible to replace at a future date. Surrendering a variable annuity contract would lock in potentially temporary decreases in account value and could result in the loss of living benefit protection that becomes more valuable when market conditions depress account values below trigger points. Further, mitigating contract features such as surrender charges and the insurer's right to delay the processing of withdrawals and surrenders for up to 30 days are common.

There are also non-contractual mitigating factors at play, such as potential negative tax consequences, that further reduce the short-term nature of liquidity risk for life insurers.

Simply put, policyholders are highly disincentivized to give up the likely irreplaceable protection for which they have already paid. The run-like mass surrender of insurance policies would require large numbers of policyholders to act against their self-interest.

From a holistic risk perspective, liquidity stress is traditionally experienced on the asset side. One short-term consequence of market turmoil could be a requirement to post collateral in connection with existing derivative contracts. However, even in this scenario, collateral is typically posted in the form of securities, so a demand for cash is not generated.

We do acknowledge liquidity risk does exist with respect to shorter time horizons and that many insurers do consider shorter time horizons (7-days for example) as part of their internal liquidity stress testing framework. This is viewed as a cash management/Treasury function impacting the daily operations of individual insurers, however, that would not affect the industry as a whole.

Hence, these considerations are typically reviewed as part of individual/microprudential surveillance efforts in the U.S.

2.3 Insurer's Internal Liquidity Stress Testing System

Insurers are to use their own internal liquidity stress testing system to perform the regulatory LST, adjusting for regulatory assumptions, metrics, etc., as specified in this document. For example, assessing materiality of stressed cash flows for inclusion in the liquidity uses and sources templates is per the insurer's own internal methodology, but determining which legal entities are to perform the LST and report on those templates is specified in this document. Insurers should provide a narrative description of their internal liquidity stress testing system and processes, including for example their materiality thresholds for stressed cash flows and methodology for converting foreign currencies to US dollars (see Section 7. Reporting). The stress scenarios may vary from year-to-year and contain variations referred to as "What-if" scenarios. The following sections provide a further description of each of the key components of the framework.

Section 3. Legal Entities Required to Perform the LST for Insurers Meeting the Scope Criteria

The scope of entities included within an insurance group for the purposes of liquidity stress testing to assess the potential for large scale liquidation of assets (i.e., the legal entities within the group which should perform the LST), should include:

- U.S. Life insurance legal entities, including reinsurers, regardless of corporate structure, so including captive (regulators specifically want all U.S. life insurance/reinsurance legal entities to perform the 2022 LST for informational purposes – future LST iterations may see a materiality consideration added);
    - Non-guaranteed/market value separate accounts are not included in the 2022 LST. However, regulators may want to perform a separate account study in the future. The current thinking is that even though non-guaranteed/market value separate accounts may experience asset sales during stressed environments, those sales are at the policyholder's discretion and do not generate

liquidity stress for the insurer/group. As such they are deemed other market activity rather than insurance entity activity. Thus, for annuities that provide both non-guaranteed and guaranteed benefits, insurers should only include the cash flow impact of the guaranteed benefits. Though not required for the 2022 LST, insurers should consider including non-insulated separate account amounts as if they were general account amounts.

    - Non-U.S. life insurance/reinsurance legal entities should perform the 2022 LST if they pose material liquidity risks to the U.S. group (see below on non-U.S. legal entities).

- Where applicable, holding companies that could be a source or draw of liquidity to the life insurance legal entities; and
- Non-life insurance entities and non-insurance entities with material sources of liquidity, or that carry out material liquidity risk-bearing activities and could, directly or indirectly, pose material liquidity risk to the U.S. group. This materiality consideration should occur within the context of the specific stress scenario (and "what if" modification if applicable). The materiality criteria and initial list of legal entities in scope should be reviewed by the lead state regulator and modified by the insurer as needed based on regulator direction.
    - Non-U.S. legal entities (including non-U.S. holding companies) are subject to this materiality consideration and should be subject to performing the LST if they pose material liquidity risk to the U.S. group.
    - U.S. non-life insurers and reinsurers are not automatically exempted. If the U.S. non-life insurer poses material liquidity risk, per the stress scenario, to the U.S. group, then that legal entity insurer should perform the LST.
- Legal entity asset managers and mutual funds (both U.S. and non-U.S.) are **excluded** from performing the 2022 LST.
    - However, those legal entities performing the LST (e.g., holding companies that could be a source or use of liquidity for the life insurers) must reflect any material stressed cash flows from/to the legal entity asset manager/mutual fund in their 2022 LST results (e.g., the liquidity sources and liquidity uses templates, as they

do with any other type of legal entity that has material stressed cash flows from/to the legal entities performing the LST).

- If such material stressed cash flows from/to the legal entity asset manager/mutual fund exist, the regulators want specific disclosures on those in the results (either by adjusting the templates to include a line for these and/or in the narrative/explanatory disclosures submitted along with the templates).
- Examples of when such legal entity asset manager/mutual fund considerations and disclosures would need to be made for a specific stress scenario include:
    - If the holding company or another legal entity(ies) in the group is expected to fund a material liquidity shortfall of a mutual fund/asset manager (i.e., redemptions exceed the ability to sell assets), then the expected cash flows must be reflected (especially where there are established inter-affiliate support agreements);
    - If the holding company or another legal entity(ies) in the group is expected to provide capital to the mutual fund/asset manager or is expecting dividends from them, the material expected cash flows must be reflected; and
    - If the asset manager manages financial instruments under which it retains some risk, such as new European CLOs, or has contractual risk retention agreements for US CLOs, the required risk retention limit (5% for Europe) must be reflected if sourced from the holding company or another legal entity(ies) in the group and considered material.

- Legal entity banks (both U.S. and non-U.S.) are **excluded** from performing the 2022 LST.
    - However, those legal entities performing the LST (e.g., holding companies that could be a source or use of liquidity for the life insurers) must reflect any material stressed cash flows from/to the legal entity bank in their 2022 LST results (e.g., the liquidity sources and liquidity uses templates, as they do with any other type of legal entity that has material stressed cash flows from/to the legal entities performing the LST).

- If such material stressed cash flows from/to the legal entity bank exist, the regulators want specific disclosures on those in the results (either by adjusting the templates to include a line for these and/or in the explanatory disclosures submitted along with the templates).
- Examples of when such legal entity bank considerations and disclosures would need to be made for a specific stress scenario include:
    - If the holding company or another legal entity(ies) in the group is expected to fund a material liquidity shortfall of a bank, then the expected cash flows must be reflected (especially where there are established inter-affiliate support agreements); and
    - If the holding company or another legal entity(ies) in the group is expected to provide capital to the bank or is expecting dividends from them, the material expected cash flows must be reflected.

For 2022, the legal entities identified in the bullets above, per a Company's ORSA and/or other materiality criteria applied to the specific stress scenario, must be considered as material or identified as carrying out material liquidity risk bearing activities and hence subject to internal liquidity stress testing requirements. Although a legal entity in the group may not be required to perform the stress test due to materiality considerations or exemptions, those entities' material cash impacts on entities performing the stress test must be captured in the sources and uses templates of the entities performing the LST. The insurer will need to disclose the materiality criteria (agreed upon by the Lead State regulator) used in determining the legal entities subject to the 2022 LST in the submission of its results. Based on the results of the 2020 initial LST exercise and those of the 2021 and 2022 LST filings, the Subgroup will determine if additional materiality criteria should be developed to ensure better comparability amongst insurers.

Section 4. Cash Flow Approach – Liquidity Sources and Uses

The Liquidity Stress Testing Framework is anchored by a cash flow approach, utilizing companies' actual cash flow projections of sources and uses of liquidity over various time horizons based upon experience and expectations. This contrasts with a Balance Sheet Approach, which employs

static balance sheet amounts and generic assumptions about asset liquidity. While a Balance Sheet Approach is easier to apply and provides calculation consistency (and thus the perception of increased comparability), its 'one-size fits all' approach could result in a misleading assessment of liquidity risk and fail to capture certain asset activities or product features under different stress scenarios and time horizons. The cash flow approach is deemed more dynamic and hence to capture liquidity risk impacts more precisely.

The insurer should produce cash flow projections for sources of liquidity and uses of liquidity that cover: operating items, investments and derivatives, capital items, and funding arrangements. (See Liquidity Sources and Uses templates in Section 7). To clarify an issue regarding funding arrangements, the projected cash flows for liquidity sources and uses should include already existing funding arrangements such as FHLB draws outstanding in the current time period. Also, specific to the holding company, these projected cash flows for liquidity sources and uses should include material non-U.S. impacts as well.

The insurer will produce these liquidity sources and uses cash flow projections in a baseline, normal course of business scenario, for each time horizon. The insurer will also produce these cash flows for each time horizon for a specific number of required stress scenarios (for 2022 there are 2 stress scenarios and also an insurer-specific worst-case scenario).

4.1 Baseline Assumptions for Cash flows

Baseline (pre-stress) cash flows are the insurer-specific cash flows from normal expected operations. Insurers should prepare cash flow projections under normal operating conditions and report the net cash flows (projected liquidity sources less uses) for each time horizon. These cash flow projections should be consistent with those used for internal baseline liquidity forecasts, such as those used for financial planning and analysis (FP&A), risk management, etc. A positive net cash flow is presumed in the baseline cash flows since companies are usually not expected to be operating in a net cash flow deficiency state.

Section 5. Stress Scenarios and their Assumptions

For year-end 2022 there are two regulatory liquidity stress scenarios: an adverse liquidity stress scenario for insurers, and an interest rate spike scenario. There is also an insurer-specific

information request for each group's own most adverse liquidity stress scenario(s). The adverse liquidity stress scenario contains a regulator provided narrative, regulator-prescribed assumptions, and company-specific assumptions. The interest rate spike scenario allows all other narrative description components and key metrics (including how much interest rates spike) to be provided by each company. The insurer-specific information request contains a company provided narrative and a description of key company metrics. The regulator provided narrative will be a qualitative description of the specified stress scenario to highlight the particular risks and sensitivities associated with that stress scenario. The regulator prescribed assumptions are specific parameters insurers should incorporate into their process for a particular stress scenario. Company-specific assumptions should be consistent with the information provided in the regulator provided narrative and regulator prescribed assumptions, and represent the detailed assumptions needed for a specific company's liquidity stress testing process. Examples of where companies should provide their assumptions include: debt issuance, lapse sensitivity, new business sensitivity and mortality sensitivity. Regulators expect insurers to utilize policyholder behavior assumptions (e.g., surrenders and policy loan withdrawals, existence of new sales activity) as well as the insurer's response (e.g., assuming delays in payment of policyholder benefits), consistent with the severity of the stress, and to provide very thorough explanatory information. All key business activities and product- type impacts to liquidity should be considered by the companies.

If the insurer's internal model does not utilize a specific economic and/or company-specific assumption included in this document, the internal model does not need to be modified to incorporate it. However, if the insurer's internal model does utilize a specific economic and/or company-specific assumption included in this document, the insurer should use the approach outlined below to calculate the value for that assumption. (This emphasizes the macro surveillance benefit of the 2022 LST, allowing for a level of consistency of assumptions across the industry. As discussed previously, this is not meant to specify assumptions used by the insurers in their own internal liquidity stress testing work.) If there is no specific value included in the 2022 LST Framework and instead there is an illustrative value or suggested guidance, the company should use a value consistent with the illustrative value or suggested guidance. For example,

guidance is given below on using Moody's values for migration, default, and recoveries. However, insurers may use S&P data or other appropriate data sources.

5.1 Adverse Liquidity Stress Scenario for Insurers

5.1.1 Narrative

Insurers are required to apply an adverse liquidity stress scenario as one of the two stress scenarios. The following is a summary of market conditions in the adverse scenario extracted from the Federal Reserve Board's 2017 Supervisory Scenarios for Annual Stress Tests Required under the Dodd-Frank Act Stress Testing Rules and the Capital Plan Rule.

The adverse scenario is characterized by weakening economic activity across all economies included in the scenario. This economic downturn is accompanied by a global aversion to long-term fixed-income assets that, despite lower short-term rates, brings about a near-term rise in long-term rates and steepening yield curves in the United States and the four countries/country blocks in the scenario.

The economic indicator levels described below provide the backdrop for the economic climate insurers should assume in the adverse scenario. The actual levels insurers should use in the adverse scenario are provided in Annex 2.

- Macroeconomic
    - Real GDP falls slightly more than 2 percent from the pre-recession peak in the fourth quarter of 2016 to the recession trough in the first quarter of 2018.
    - *Unemployment rate increases.*
    - *Headline CPI falls and then rises over the scenario period.*
- Interest Rates and Credit Spreads
    - *Short-term Treasury rates fall and remain near zero throughout the stress.*
    - *10-year Treasury yields rise.*
    - *Investment Grade (IG) corporate credit spreads widen.*
- Asset Valuations
    - *Equity prices decline by roughly 40%.*

- *The Volatility Index (VIX) peaks at approximately 35.*
- *Housing prices and commercial real estate prices decline through 8 quarters.*

- Description of International Market Conditions
  - *Recessions and slowdowns in growth are experienced in the Euro area, United Kingdom, Japan, and developing Asia economies.*
  - *All foreign economies experience a decline in consumer prices.*
  - *U.S. Dollar appreciates against the Euro, British Pound, and developing Asia currencies.*
  - *U.S. Dollar depreciates modestly against the Japanese Yen, driven by flight-to-safety capital flow.*

5.1.2 Regulator-Prescribed Assumptions

Insurers should utilize the values for the economic indicators from the Federal Reserve Board's annual Supervisory Scenarios for Annual Stress Tests Required under the Dodd-Frank Act Stress Testing Rules and the Capital Plan Rule as the basis for scenario assumptions, Table A.1 Historical data and Table A.5 (Annex 2i, A) Supervisory adverse scenario. Insurers should use the version published in February 2017 (refer to the tables in Annex 2i). Specifically, insurers should run the adverse liquidity stress scenario using the deltas for the Treasury curve, Corporate spreads, GDP, Unemployment, U.S. Inflation (CPI), Housing Price Index (HPI), S&P 500 index (SPX SPOT), Commercial Real Estate Index (CREI) and VIX index. Theses economic variables should be used to the extent these variables are included in an insurer's internal liquidity stress test process or models.

Insurers should apply the same change in economic variables experienced between Q4 2016 Table A.1 and the stress scenarios in Table A.5 to current economic variable levels (Annex 2i, D). Insurers should use the tables in Annex 2i for an illustrative example of how the deltas from the 2017 Fed's CCAR are applied to the current reference quarter (Q4 2020) for the 2020 LST (Annex 2i, B). For example, insurers should use 2022 (or most recent year-end) 10 Yr. Treasury rates and apply the same percentage or absolute b.p. change shown from Q4 2016 to the 2017 Table A.5 amounts in their 2022 LST stress scenarios. Table C (Annex 2i, C) shows the 2017 deltas applied

to 2021 year-end levels on an absolute and percentage basis for 3 month and 1-year horizons for ease of use. The deltas to apply are provided for the 30-day, 90-day and 1-year horizons. Note, the tables also include structured spread assumptions described below in section 5.1.4. The tables are included in Annex 2i of this document.

In addition, other market indicators are necessary for insurers to apply to stressed cash flows and to assess the impact on expected asset sales. These are as follows (with details to be found in Annex 2):

- Market Capacity Assumption
- Economic Variables for Adverse Scenario
- SWAP Spreads
- Swaption Volatility
- Credit Assumptions: Moody's Transition Matrix/Migration Rates
- Credit Assumptions: Moody's Default Table
- Credit Assumptions: Moody's Recovery Rate Table

Necessary edits for 2022 year-end values will be posted as Lead State Guidance to the Annexes in early 2023.

5.1.3 Market Capacity Assumption

The following is suggested guidance to determine market constraints on asset categories to be sold in times of stress. It represents standards followed by many insurers to estimate assets sales by stress scenario, asset category and time horizon that can be sold without meaningfully impacting the entire market by widening bid-offer spreads. We recognize each company has its own individual methodology for determining potential asset sales under stress, and we request a written narrative be provided as to how they make their determination.

Once an asset class has been identified as available to be sold to satisfy a cash deficiency from cash flow stress testing, the insurer should calculate its percentage of the total amount issued

and outstanding. Next the insurer should obtain average daily trading volumes (ADTV) and make an assumption for the haircut amount to apply to that volume to reflect stressed conditions (the "haircut ADTV"). Next, the insurer would apply its calculated percentage of total outstanding owned to the haircut ADTV, and the result would be divided by the number of days in the stress testing time horizon to arrive at a daily amount that can be sold. This daily amount able to be sold would be multiplied by the number of days in the prescribed time horizon: 30 days for the 30-day horizon, 60 days for the 90-day horizon (31-90 days) and 274 days for the 1-year horizon (91-365 days). An illustrative example best explains the above-described process.

Illustrative example (also included in Appendix 2ii):

Step 1: Estimate Unconstrained Sales Per Day

Insurer A has a $100 billion portfolio of investment-grade corporate bonds, priced at par. Insurer A estimates that it holds approximately 5% of outstanding corporate bonds. In the adverse liquidity stress scenario, Insurer A's unconstrained liquidity stress testing model assumes that it can sell:

Time Horizon	% Able to Be Sold	Sale Price	Total Sale	Sales / Day
First 30 Days	**10%**	**97**	**$9.7 B**	**$440 M**
31-90 Days	**20%**	**94**	**$18.8 B**	**$430 M**
91-365 Days	**50%**	**90**	**$45.0 B**	**$230 M**

Step 2: Add Market Capacity Constraint

Assume the average daily trading volume in the secondary market for investment grade corporate bonds has been $13.0 Billion over the past year. Insurer A estimates that trading volumes would decline by 40% in the adverse liquidity stress scenario to $8.0 B per day. Since Insurer A is 5% of the market, Insurer A can only trade $400 M per day ($8B x 5%) without paying a significant illiquidity premium and impacting the overall market.

Insurer A then repeats this process for every asset class in its investment portfolio.

Time Horizon	Unconstrained Sales / Day	Market Capacity Assumption	Impact
First 30 Days	**$440 M**	**$400 M**	**($40 M)**
31-90 Days	**$430 M**	**$400 M**	**($30 M)**
91-365 Days	**$230 M**	**$400 M**	**$0**

5.1.4 Economic Variables for Adverse Scenario

Insurers should use Annex 2i and 2iii to assist in determining cash flows, asset values and the quantity of assets to be sold in stressed markets. For baseline values, the industry shall submit year-end spreads to the regulators shortly after year-end. The regulators will review and approve the values for use in the table for liquidity stress testing purposes. Structured spread data was derived from the JPMorgan ABS Weekly Asset Spread Datasheet. The spreads were scaled to a stressed economic environment consistent with an adverse scenario as described by the Fed, described above and adopted for this stress testing. For the 2020 LST, economic conditions experienced in March of 2020 were deemed consistent with an adverse scenario. Therefore, structured spreads from March 2020 were used as the basis for the stressed spreads assumptions for insurers to use in their stress testing scenario for the 30-day, 90-day and 1-year horizons. Note, to calculate structured spreads for CLO/CDO 5.5-7 year and ABS Auto3 year, it was necessary to construct a Treasury yield curve with 3-year and 7-year points. These points were calculated using a straight-line linear interpolation method. For the 2022 LST, the same March 2020 structured spreads were deemed appropriate for use.

Regulators ask industry members to agree on one set of structured spread values amongst themselves to submit for approval, not each insurer submitting values that each need to be approved. Regulators and/or the NAIC need to do a reasonableness check of current baseline/market levels of spreads insurers use before applying the stressed amounts in the JPMorgan spreadsheet. For example, if current spreads are already greater than the JPMorgan stressed spread amounts, regulators may have to consider alternatives or additional stressed levels. One agreed upon set of values will help provide uniformity, consistency, and comparability of stress testing results across insurers.

When utilizing these spreads, insurers should assume the percentage increase in spreads experienced in March 2020 from the JPMorgan ABS Weekly Asset Spread Datasheet; and apply the absolute increase to the agreed upon December 31 baseline spreads. These tables are provided in Annex 2i, B.

Since the reasonableness check is merely a check of current market rates, it is not anticipated that it will be burdensome for insurers to provide an agreed upon set of December 31 baseline values to regulators by January 31 of each year or for the regulators to be able to respond by February 28 of every year to allow insurers sufficient time to incorporate into their stress testing framework. Baseline amounts are included in Annex 2i, B.

For the 2022 LST – NAIC values are to be established as Lead State guidance in early 2023 after the 2022 LST Framework has been adopted. These NAIC values will be established using the industry developed process.

5.1.5 SWAP Spreads

Stressed spread levels may impact assets prices for expected sales calculations necessary for the stress scenarios. Insurers should complete the SWAP Spread table in Annex 2iv to document assumptions used in determining asset values and the quantity of assets to be sold in stressed markets. SWAP spread source data is no longer provided in the Federal Reserve's H.15 FRED data. Use of Bloomberg Swap Spreads is preferred – if options exist within Bloomberg, identify which option was used. If a different source from Bloomberg is used, then identify the source and option.

5.1.6 Swaption Volatility

Insurers should use the table in Annex 2v to assist in determining asset values and the quantity of assets to be sold in stressed markets. Insurers should obtain the information to populate the table using Bloomberg's Swaption Volatility for various time horizons and expiry. For consistency, insurers should use the table found on Bloomberg at NSV [Go].

Commented [ST1]: To be updated as Lead State Guidance in early 2023.

5.1.7 Moody's Transition Matrix/Migration Rates

Insurers should use the table in Annex 2vi to assist in determining corporate credit migrations, asset values and the quantity of assets to be sold in stressed markets. The table is imported from Moody's Corporate-Global: Annual default study, Exhibit 36 - Average one-year alphanumeric rating migration rates, 1983-2021. If available, insurers should use the equivalent Moody's tables for U.S. Public Finance for municipal bonds and the appropriate Moody's tables for structured /asset-backed securities. Alternative sources may be used but should be disclosed as well as the rationale for their use.

Commented [ST2]: To be updated as Lead State Guidance in early 2023.

5.1.8 Moody's Default Table

Insurers should use the table in Annex 2vii to assist in determining asset values and the quantity of assets to be sold in stressed markets. The table is imported from Moody's Corporate-Global: Annual default study, Exhibit 41 - Average cumulative issuer-weighted global default rates by letter rating, 1983-2021. Insurers should use the equivalent Moody's tables for U.S. Public Finance for municipal bonds and the appropriate Moody's tables for structured /asset-backed securities. Alternative sources may be used but should disclosed as well as the rationale for their use.

Commented [ST3]: To be updated as Lead State Guidance in early 2023.

5.1.9 Moody's Recovery Rate Table

Insurers should use the table in Annex 2viii to assist in determining asset values and the quantity of assets to be sold in stressed markets. The table is imported from Moody's Corporate-Global: Annual default study, Exhibit 8 - Average corporate debt recovery rates measured by ultimate recoveries, 1987-2021. Insurers should use the equivalent Moody's tables for U.S. Public Finance for municipal bonds and the appropriate Moody's tables for structured /asset-backed securities. Alternative sources may be used but should disclosed as well as the rationale for their use.

Commented [ST4]: To be updated as Lead State Guidance in early 2023.

If relevant for a given insurer, the adverse liquidity stress scenario for insurers can be run considering sources other than expected asset sales (e.g., FHLB credit line draws, bank lines of credit and holding company contributions). Should that be the case, the insurer must clearly identify the sources other than asset sales utilized to meet expected liquidity deficiencies.

5.1.10 "What If" Modification

The "What if" modification to the adverse liquidity stress scenario removes the ability for insurers to use extraordinary internal and external funding sources to satisfy any liquidity deficiency under stress, i.e., no actions taken in response to the stress (as opposed to ongoing operational funding agreements included in the insurer's baseline templates) or in response to a liquidity deficiency. Intragroup "keep well" agreements would be considered extraordinary transactions. Thus, expected asset sales will be the primary source of meeting any liquidity deficiency for the "What if" scenario. Any existing funding such as commercial paper will not be assumed to roll, nor will FHLB facilities ability to roll upon maturity.

5.1.11 Company-Specific Assumptions

Insurers must construct the assumptions needed for their internal models to run the above adverse liquidity stress scenario for insurers. Company specific assumptions should be consistent with the above scenario as narrative and regulator prescribed assumptions. Examples include the inability to roll or issue new debt, potential increases in lapse rates, new business sensitivity, mortality experience and policyholder behavior (e.g., surrenders and policy loans).

5.2 Interest Rate Spike Scenario

5.2.1 Narrative

Insurers should run an interest rate spike stress test that resembles the late 70's/early 80's inflationary period as it most closely mirrors the regulatory desired interest rate spike scenario. Historical data from the late 70's/early 80's show the following economic conditions:

- Inflationary forces caused interest rates to rise quickly.
- Investors rotated out of fixed income and into equities, real estate, and commodities.
- Central bank responded by tightening monetary policy in tandem, eventually causing the yield curve to invert.

Insurers should provide a detailed narrative outlining their scenario and assumptions around general economic conditions bulleted above and specific assumptions for economic variables for each time horizon. The economic variables in the table below and the amount of expected

movement in each variable should be fully described in the narrative to the extent are used in a company's internal model. The table outlines the directional movement of the relevant economic indicators. Insurers should specify the amount of movement for each variable they consider to be part of the scenario for a severe interest rate spike. For example, insurers may indicate a parallel shift in Treasury rates up 100bps in the first 30 days, up 200bps in 90 days and 300bps over 12 months. The table is a guide and not to be interpreted as a strict template and may be supplemented or customized by the insurer. Narrative/Explanatory disclosures should explain these assumptions.

5.2.2 Regulator-Prescribed Assumptions

Regulators did not adopt any regulator-prescribed assumption values for this stress scenario. Instead, they provided the below regulator guidance for insurers to use when establishing their own company specific assumptions for this stress scenario.

Economic Variable	**Expected Movement**	**Comments**
Treasury rates	Increase rapidly	Critical factors for modeling impacts to asset prices, collateral flows, and product cash flows
Equity prices	Increase rapidly	
Credit spreads	Increase moderately	
Inflation rates	Increase rapidly	These factors help define the macroeconomic conditions of the scenario
Real GDP growth	Flat	These factors help define the macroeconomic conditions of the scenario
Unemployment rate	Flat	
Real estate prices	Increase	
Swap spreads	Increase	Impact derivative collateral requirements
FX rates	Unclear	
Implied volatility	Increase	
Credit assumptions (transition, default, recovery rates)	Unclear	May not be an important assumption to define for the scenario

5.2.3 Company-Specific Assumptions

Insurers must construct the assumptions needed for their internal models to run the above stress scenario. Companies are encouraged to provide more information beyond these guidelines as they feel is appropriate to help regulators understand their assumptions for the scenario.

Company specific assumptions should be consistent with the stress scenario's narrative and regulator prescribed assumptions. Based on the 2022 significant increases to inflation and interest rates, insurers should consider increasing the 2021 values for use in the 2022 LST to ensure a "severe interest rate spike."

5.3 Insurer Specific Information Request - Worst-Case Scenario

5.3.1 Narrative

This information request requires insurers to provide a detailed narrative of their most severe liquidity stress scenario(s) to obtain greater insight to the drivers of liquidity risk for specific insurers. The most severe scenario should be one that results in the largest liquidity deficiency (liquidity sources less uses) from their existing internal liquidity stress testing process. The scenario should be focused on the insurer's internal model scenario with the worst-case outcome for the group. Regulators may use this information to inform future prescribed stress scenarios.

Insurers should provide a comprehensive narrative describing the stress scenario(s) and the economic environment(s). This stress scenario(s) could be a combination of multiple stressors. Insurers should review these scenarios to ensure they are worst case for their business model, products, etc., particularly if no liquidity deficiencies are identified.

Section 6. Available and Expected Asset Sales

Once the stressed sources and uses of liquidity have been established, and the net cash flows calculated, insurers then project the assets available at the end of the time horizon by asset category (please refer to the asset categories in the Assets Template in Section 7). The valuation of available assets for the baseline scenario utilizes current and projected asset values for a normal operating environment. The valuation of available assets for a stress scenario will be based upon fair value haircuts per the specific stress scenario narrative, its regulatory prescribed assumptions, and/or the company assumptions based on the narrative and regulatory prescribed assumptions (e.g., fair market value haircuts and capacity indicators). Note: Any securities pledged as part of institutional funding agreements (e.g., FHLB) should be excluded and

considered encumbered. However, any pre-pledged assets that are not securing credit that has been extended and remains outstanding (i.e., excess) should be considered unencumbered.

To the extent that stressed cash inflows are insufficient to meet the anticipated cash outflows, the insurer must provide for cash flows to meet the deficiency. Unless a stress scenario (or "What-if" modification of a stress scenario) indicates otherwise, the insurer can utilize internal and external funding sources (e.g., FHLB new draws) as well as asset sales to satisfy a liquidity deficiency. Any expected asset sales must be reported in the appropriate column(s) of the template. Insurers decide which categories of available assets to sell, as well as the quantity to sell. (Please refer to the Assets Template in Section 7.)

Asset sales will appear in two different places - 1) within the liquidity sources template for expected/planned activity during the time horizon (pre-liquidity deficiency calculation), and 2) in the assets template for any amount of asset sales used to meet a liquidity deficiency (Liquidity Sources less Liquidity Uses). If an insurer has no liquidity deficiency, then there are no asset sales needed in the Assets Template (though available assets still apply). Similarly, if cash on hand was sufficient to meet the liquidity deficiency and the insurer chose to utilize that cash, then no asset sales would be reported in the Assets template.

The expected asset sales amounts calculated based on the insurer's own models should also be subjected to portfolio manager and/or Chief Investment Officer (CIO) feedback. This feedback may take the form of "topside" adjustments to the expected asset sales. Regulators expect robust disclosures around the chief investment officer's (or equivalent title or designee) assumptions and decisions on expected asset sales. The intent is for these asset sales to most accurately represent what actions the insurer could reasonably take in the given scenario, market conditions, and the company's anticipated investment policy and/or strategy.

Section 7. Reporting

Insurers should submit data in the reporting template for liquidity sources, liquidity uses, and assets (available assets and expected asset sales) in US dollars. These templates utilize categories for 30-day, 90-day and 1-year time horizons. The assets template further illustrates available

assets and final expected asset sales by asset sub-category to cover any liquidity deficiency (negative amounts of net liquidity sources less liquidity uses over the prescribed time horizons). Use of these consistent sub-categories of assets is critical for allowing the Task Force to aggregate the asset sales results.

Liquidity Sources and Liquidity Uses Templates:

A liquidity sources report and a liquidity uses report should be generated for each legal entity within the group that was subjected to liquidity stress testing, using the NAIC templates. These legal entity amounts should also be aggregated into a group liquidity sources report and a group liquidity uses report for submission (the LST is not performed at the group level; rather it is performed at the legal entity level and those results are aggregated to present a group level report).

- For the Baseline, the Adverse Liquidity stress scenario, and the Interest Rate Spike stress scenario, Liquidity Sources and Liquidity Uses templates at both the individual entity level and the aggregated group level are to be submitted.
- For the "What If" Variation of the Adverse Liquidity stress scenario, a group level Liquidity Sources template and/or a group level Liquidity Uses template is only required if there is a material difference from the Adverse Liquidity stress scenario's group level Liquidity Sources and Liquidity Uses templates.

Assets Template:

As with the Liquidity Uses and Liquidity Sources templates, the Assets template is to be generated for each legal entity performing the LST. For the 2022 LST, the insurer may submit the assets template at the group level only, without submission of the legal entity asset sales templates.

- A group level assets template is required for the Baseline and all stress scenarios, including the "What If" variation of the Adverse Liquidity stress scenario.

Modification of Templates:

Insurers are allowed to add lines to the templates to provide more detailed breakdown of existing categories (e.g., for cash flows to/from legal entity asset manager/mutual funds as well as banks), but deletions of existing lines/categories are highly discouraged.

Submission Deadline:

The reporting templates and many other narrative disclosures referenced in this document are to be submitted to the Lead State by June 30, 2023.

Section 8. Templates

8.1 Liquidity Sources Template

Cash Flow	CF Type	CF Category	Group Summary			Legal Entity 1		
			1 Month	3 Month	12 Month	1 Month	3 Month	12 Month
Sources	Operating	Premiums and Deposits (Renewal / New Business)	-	-	-	-	-	-
		Cash Charges / Fees	-	-	-	-	-	-
		Reinsurance Recoverables	-	-	-	-	-	-
		Expenses – Intercompany Settlements	-	-	-	-	-	-
		Tax Payments (Inflows)	-	-	-	-	-	-
		Other Flows	-	-	-	-	-	-
			-	-	-	-	-	-
	Investment and Derivatives	Principal and Interest	-	-	-	-	-	-
		Dividends / Distributions	-	-	-	-	-	-
		Initial and Variation Margin Received	-	-	-	-	-	-
		Other Collateral Received	-	-	-	-	-	-
		Asset Sales (Pending Settlement)	-	-	-	-	-	-
		Other Flows	-	-	-	-	-	-
			-	-	-	-	-	-
	Capital	Capital Contributions	-	-	-	-	-	-
		Commitments	-	-	-	-	-	-
		Dividends from Subsidiaries	-	-	-	-	-	-
		Other Flows	-	-	-	-	-	-
			-	-	-	-	-	-
	Funding	Debt Issuance / Refinancing	-	-	-	-	-	-
		GICs	-	-	-	-	-	-
		FHLB	-	-	-	-	-	-
		Repo / Securities Lending	-	-	-	-	-	-
		Credit Facilities (Incl. Contingency Funding Facilities)	-	-	-	-	-	-
		Intercompany Loans	-	-	-	-	-	-
		Commercial Paper	-	-	-	-	-	-
		Other Flows	-	-	-	-	-	-
		Total Sources (before Asset Sales)	-	-	-	-	-	-

Note 1: Certain flows could be settled in securities (e.g., margins on derivatives, capital contributions/dividends, etc.). See the more specific Security Collateral guidance within the Excel templates.

Note 2: Asset Sales (pending settlement) should include trades executed prior to the reporting date with a known settlement date after the reporting date (for example 12/30 trade date and 01/03 settle date).

Note 3: Asset Commitments should include anticipated cash flows related to settlement of a future obligation to a counterparty to the extent, and in the amount, appropriate for the specific stress scenario and economic assumptions. Examples could include capital calls for alternative investments, mortgage loan fundings, etc., and should include each company's best estimate as to what they would expect to fund under each scenario. If these commitments have been explicitly prefunded/collateralized by highly liquid assets, asset commitments should be reported on a net basis, including proceeds from the sale of the highly liquid assets in an amount consistent with the specific stress scenario and economic assumptions. This line item may include some percentage amount of commitments to fund private placement revolvers consistent with the specific stress scenario and economic assumptions, but revolvers and lines of credit themselves should be captured in the credit facilities line in the Sources Funding section.

8.2 Liquidity Uses Template

Cash Flow	CF Type	CF Category	Group Summary			Legal Entity 1		
			1 Month	3 Month	12 Month	1 Month	3 Month	12 Month
Uses	Operating	Non-Elective Benefits / Claims	-	-	-	-	-	-
		Elective Benefits / Claims	-	-	-	-	-	-
		Commissions	-	-	-	-	-	-
		Reinsurance Payables	-	-	-	-	-	-
		Expenses - Other	-	-	-	-	-	-
		Expenses - Intercompany Settlements	-	-	-	-	-	-
		Insurance Product Commitments	-	-	-	-	-	-
		Tax Payments (Outflows)	-	-	-	-	-	-
		Other Flows	-	-	-	-	-	-
			-	-	-	-	-	-
	Investment and Derivatives	Asset Commitments	-	-	-	-	-	-
		Initial and Variation Margin Paid	-	-	-	-	-	-
		Other Collateral Pledged	-	-	-	-	-	-
		Asset Purchases (Pending Settlement)	-	-	-	-	-	-
		Other Flows	-	-	-	-	-	-
			-	-	-	-	-	-
	Capital	Shareholder/Policyholder Dividends	-	-	-	-	-	-
		Capital Contributions to Subsidiaries	-	-	-	-	-	-
		Dividends to Parent	-	-	-	-	-	-
		Other Flows	-	-	-	-	-	-
			-	-	-	-	-	-
	Funding	Debt Maturities / Debt Servicing	-	-	-	-	-	-
		GICs Benefits / Maturities	-	-	-	-	-	-
		FHLB	-	-	-	-	-	-
		Repo / Securities Lending	-	-	-	-	-	-
		Credit Facilities (Incl. Contingency Funding Facilities)	-	-	-	-	-	-
		Intercompany Loans	-	-	-	-	-	-
		Other Flows	-	-	-	-	-	-
			-	-	-	-	-	-
		Total Uses	-	-	-	-	-	-

Note 1: Certain flows could be settled in securities (e.g., margins on derivatives, capital contributions/dividends, etc.). See the more specific Security Collateral guidance within the Excel templates.

Note 2: Asset Purchases (pending settlement) should include trades executed prior to the reporting date with a known settlement date after the reporting date (for example 12/30 trade date and 01/03 settle date).

Note 3: Asset Commitments should include anticipated cash flows related to settlement of a future obligation to a counterparty to the extent, and in the amount, appropriate for the specific stress scenario and economic assumptions. Examples could include capital calls for alternative investments, mortgage loan fundings, etc., and should include each company's best estimate as to what they would expect to fund under each scenario. If these commitments have been explicitly prefunded/collateralized by highly liquid assets, asset commitments should be reported on a net basis, including proceeds from the sale of the highly liquid assets in an amount consistent with the specific stress scenario and economic assumptions. This line item may include some percentage amount of commitments to fund private placement revolvers consistent with the specific stress scenario and economic assumptions, but revolvers and lines of credit themselves should be captured in the credit facilities line in the Sources Funding section.

8.3 Assets Template

Cash and Invested Assets Available for Sale		Group Summary		
Asset Category	**Asset Sub-Category**	**1 Month**	**3 Month**	**12 Month**
Cash	Cash & Cash Equivalents	-	-	-
Government Securities	Treasury Bonds	-	-	-
	Agency Bonds	-	-	-
	Other IG Sovereigns & Regional Government	-	-	-
	Below IG Sovereigns & Regional Government	-	-	-
	Agency CMO	-	-	-
	Agency MBS	-	-	-
	Agency CMBS	-	-	-
	Agency ABS	-	-	-
Public Bonds	IG Public Corporate Bonds	-	-	-
	IG Municipal Bonds	-	-	-
	Below IG Public Corporate Bonds	-	-	-
	Below IG Municipal Bonds	-	-	-
Private Bonds	IG Private Placement Bonds	-	-	-
	IG 144As	-	-	-
	Below IG Private Placement Bonds	-	-	-
	Below IG 144As	-	-	-
Non-Agency Structured Debt	IG CMO	-	-	-
	IG MBS	-	-	-
	IG CMBS	-	-	-
	IG ABS	-	-	-
	IG CLO	-	-	-
	Below IG CMO	-	-	-
	Below IG MBS	-	-	-
	Below IG CMBS	-	-	-
	Below IG ABS	-	-	-
	Below IG CLO	-	-	-
Equity	Common Stock	-	-	-
	Preferred Stock	-	-	-
	Other Equity and Alternative Investments	-	-	-
Other	Commercial, Residential, Agricultural, Bank and Other Loans	-	-	-
	Other	-	-	-
	Total Invested Assets Available for Sale	-	-	-

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Scenario	
As of Date	

Summary

	Group Summary			Legal Entity 1		
	1 Month	3 Month	12 Month	1 Month	3 Month	12 Month
Total Sources (before Asset Sales)	-	-	-	-	-	-
Total Uses	-	-	-	-	-	-
Net Sources & Uses (Deficit before Asset Sales)	-	-	-	-	-	-
Total Invested Assets Available for Sale	-	-	-	-	-	-
Cash applied to deficit	-	-	-	-	-	-
Deficit Sub-total	-	-	-	-	-	-
Total Assets Sold	-	-	-	-	-	-
Deficit satisfied if zero or greater	-	-	-	-	-	-

Final Expected Asset Sales After Adjustments				
		Group Summary		
Asset Category	Asset Sub-Category	1 Month	3 Month	12 Month
Cash	Cash & Cash Equivalents	-	-	-
Government Securities	Treasury Bonds	-	-	-
	Agency Bonds	-	-	-
	Other IG Sovereigns & Regional Government	-	-	-
	Below IG Sovereigns & Regional Government	-	-	-
	Agency CMO	-	-	-
	Agency MBS	-	-	-
	Agency CMBS	-	-	-
	Agency ABS	-	-	-
Public Bonds	IG Public Corporate Bonds	-	-	-
	IG Municipal Bonds	-	-	-
	Below IG Public Corporate Bonds	-	-	-
	Below IG Municipal Bonds	-	-	-
Private Bonds	IG Private Placement Bonds	-	-	-
	IG 144As	-	-	-
	Below IG Private Placement Bonds	-	-	-
	Below IG 144As	-	-	-
Non-Agency Structured Debt	IG CMO	-	-	-
	IG MBS	-	-	-
	IG CMBS	-	-	-
	IG ABS	-	-	-
	IG CLO	-	-	-
	Below IG CMO	-	-	-
	Below IG MBS	-	-	-
	Below IG CMBS	-	-	-
	Below IG ABS	-	-	-
	Below IG CLO	-	-	-
Equity	Common Stock	-	-	-
	Preferred Stock	-	-	-
	Other Equity and Alternative Investments	-	-	-
Other	Commercial, Residential, Agricultural, Bank and Other Loans	-	-	-
	Other	-	-	-
	Total Invested Assets Final Sale	**-**	**-**	**-**

Note 1: Insurers will enter "Illiquid" in a data field for any asset category deemed such within a specific time horizon. (Regulators can then follow up with questions later if there are concerns, etc.)

Note 2: Any securities pledged as part of institutional funding agreements (e.g., FHLB) should be excluded and considered encumbered. However, any pre-pledged assets that are not securing credit that has been extended and remains outstanding (i.e., excess) should be considered unencumbered.

Note 3: Reminder that regulators want robust disclosures regarding the chief investment officer's (or equivalent title or designee) assumptions and decisions on expected asset sales. Might need to supplement the template comments with additional narrative disclosures.

Note 4: Excluding the "What If" variation, insurers are to provide disclosures indicating when affiliated amounts are provided to assist a legal entity in addressing a liquidity deficiency.

Narrative/Explanatory Disclosures noted in the 2022 LST

Narrative/explanatory disclosures are expected to be in English.

- Insurers should provide a narrative description of their internal liquidity stress testing system and processes, including for example their materiality thresholds for stressed cash flows and methodology for converting foreign currencies to US dollars.
- Specific disclosures on material stressed cash flows to/from legal entity banks/asset managers/mutual funds if needed.
- Company-specific narrative on assumptions and metrics used for the adverse liquidity stress scenario for insurers, for example the inability to roll or issue new debt, potential increases in lapse rates, new business sensitivity, mortality experience and policyholder behavior (e.g., surrenders and policy loans).
- Company-specific narrative on the interest rate shock scenario, assumptions around general economic conditions bulleted in 5.2.1 Narrative, and specific metrics for economic variables for each time horizon. The economic variables in the table in 5.2.2 Regulator-Prescribed Assumptions should be fully described in the narrative, to the extent they are use in the company's internal model.
- Insurers should provide a comprehensive narrative describing their worst-case liquidity stress scenario(s) and the economic environment(s), including assumptions, key metrics and results.
- Written narrative on the insurer's own individual methodology for determining asset sales under stress.
- Robust disclosures regarding the chief investment officer's (or equivalent title or designee) assumptions and decisions on expected asset sales, if needed.
- Excluding the "What If" variation, disclosures to identify when affiliated amounts are contributed to assist a legal entity in addressing a liquidity deficiency.
- Disclose when a regulatory prescribed variable is not used for the LST because it is not used in the internal liquidity stress testing process or models.

[End of 2022 Liquidity Stress Testing Framework – to be included as an appendix in the NAIC Financial Analysis Handbook]

Data Aggregation

Given the NAIC's primary focus is on macroprudential impacts of a liquidity stress impacting the life insurance sector, the NAIC will aggregate final expected asset sales data across the insurance groups subject to the liquidity stress test. The aggregation will be done by asset category. The NAIC aims to compare the aggregated results against various benchmarks, potentially including normal and/or stressed trading volumes and asset values for various asset classes, to determine the impact such sales may have on the capital markets in times of stress. Findings from this analysis may also inform expected asset sale assumptions utilized in future runs of the liquidity stress test.

As part of its macroprudential surveillance, the insurance regulators and/or NAIC may reach out to other regulatory agencies to discuss aggregate results that may impact other regulated industries such as banks, securities brokers, and asset managers. Insurance regulators may also coordinate with other agencies to identify appropriate and perhaps coordinated action they may take to prevent or minimize the effect large asset sales may have on the financial markets and overall economy.

Regulatory Authority

For the 2020 and 2021 liquidity stress tests, lead state regulators utilized their examination authority to collect the reporting results from insurers and to keep the data confidential. A long-term solution was developed at the Financial Stability (EX) Task Force in coordination with addressing similar issues related to the Group Capital Calculation project, resulting in revisions to Model #440. However, it will take several years for states to adopt these revisions. As a result, some regulators will utilize their examination authority for the 2022 LST as well, while others may rely upon adopted revisions to their Holding Company Act.

Confidentiality

For the 2020 and 2021 liquidity stress tests, lead state regulators utilized their examination authority to collect the reporting results from insurers identified by the scope criteria. Existing protocols for collecting confidential/sensitive data for each state and insurer were utilized. A long-term solution was developed at the Financial Stability (EX) Task Force in coordination with addressing similar issues related to the Group Capital Calculation project, resulting in revisions to Model #440. However, it will take several years for states to adopt these revisions. As a result, some regulators will utilize their examination authority for the 2022 LST as well, while others may rely upon adopted revisions to their Holding Company Act.

Timeline

- December 2022 – Adopt the 2022 LST Framework.
- Regulators agreed to make no substantive changes for the 2022 LST Framework, including the Scope Criteria. Minor template revisions and Annex updates to the 2022 LST Framework document need to be finalized early in 2023 as Lead State Guidance to allow insurers adequate time to generate the 2022 LST filings in time for the June 30, 2023, filing deadline; ideally by the end of January 2023.
- June 2023 – Incorporate all appropriate Lead State Guidance into the 2022 LST Framework document as the starting place for the 2023 LST Framework and begin work on changes specific to the 2023 LST.

Annex 1: Original Scope Criteria with Annual Statement References

The Subgroup proposes to include in the scope of the Liquidity Stress Testing Framework any insurer/group that exceeds the following thresholds for any of the noted activities (or account balance as a proxy for that activity). The thresholds have been established taking into consideration both the account balance of the insurer/group to the total balance for the life insurance sector, as well as the aggregate account balance of insurers/groups within scope to the aggregate account balance for the life insurance sector.

Account Balances	**Threshold in $B "greater than"**	**Reference to 2017 NAIC life/accident and health (A&H) annual financial statement blank**
Fixed and Indexed Annuities	25	**Analysis of Increase in Annuity Reserves** Page: Analysis of Increase in Reserves Line: Reserves December 31, current year (15) Column: Sum of Individual Fixed Annuities, Individual Indexed Annuities, Group Fixed Annuities, and Group Indexed Annuities
Funding Agreements and GICs[i]	10	**Deposit-Type Contracts** Page: Exhibit 7 – Deposit-Type Contracts Line: 9 Column: Guaranteed Investment Contracts (Column 2) + Column: Premium and Other Deposit Funds (Column 6) IF the amount of FHLB Funding Reserves from Note 11.B(4)(b) suggests funding agreements are not reported in Column 2 of Exhibit 7 + Synthetic GICS Page: Exhibit 5 – Interrogatories Line: 7.1
Derivatives–Notional Value (absolute value)	75	**Derivatives – Notional Value (absolute value)** Pages: Schedule DB, Part A; Schedule DB, Part B, Section 1 Column: Notional Value (sum all)
Securities Lending	2	**Securities Lending Collateral Assets** Pages: Schedule DL, Part 1; Schedule DL, Part 2 Line: Total (9999999) Column: Fair Value
Repurchase Agreements	1	**Repurchase Agreements** Page: Notes to Financial Statement Investments Restricted Assets Line: Sum of 05L1C, 05L1D, 05L1E, 05L1F Column: Total (General Account Plus Separate Account)
Borrowed Money (includes commercial papers, letters of credit, etc.)	1	**Borrowed Money** Page: Liabilities Line: Borrowed Money (22) Column: Current Year

[i] In performing the addition of the FHLB funding agreement amount to the GICs amount, NAIC staff discovered that the reporting of FHLB funding agreements is not consistent in Exhibit 7, Deposit-Type Contracts. The source of the FHLB amount is Note 11.B(4)(b):

Line: Funding agreements, current year, amount as of the reporting date, borrowing from FHLB, collateral pledged to FHLB Column: Funding Agreement Reserves Established

For some insurers, we were able to match amounts from the FHLB funding agreement footnote to the exact same amount in Exhibit 7, either Column 2 (GICs) or Column 6 (Premiums and Other Deposit Funds). For those insurers where the FHLB amount matched Exhibit 7, Column 2, we did not add the FHLB funding agreement amount to the GICs amount, because that would be double-counting the FHLB funding agreements. For other insurers, even though the amounts did not match exactly, we were able to assume the FHLB funding agreements were reported in either Column 2 or Column 6 (e.g., the amount in Exhibit 7, Column 2 was zero or much smaller than the FHLB note, while the Column 6 amount was larger). However, for several insurers, we were not able to make an informed assumption (e.g., both Column 2 and Column 6 amounts were larger than the FHLB funding agreement amount). To be conservative in these instances, we added the FHLB funding agreement amount to the GICs amount. Overall, for the $10 billion threshold, adding FHLB funding agreements to GICs does not result in a different list of insurance groups from the list with GICs of more than $10 billion.

Annex 2: Regulatory Prescribed Assumptions

Annex 2i. Economic and Market Variables

A. Fed reference Table A.5 Adverse Scenario

2017 CCAR Adverse Scenario

Date	Real GDP growth	Nominal GDP growth	Real dispo-sable income growth	Nominal dispo-sable income growth	Unem-ployment rate	CPI inflation rate	3-month Treasury rate	5-year Treasury yield	10-year Treasury yield	BBB corporate yield	Mortgage rate	Prime rate	Level			
													Dow Jones Total Stock Market Index	House Price Index	Com-mercial Real Estate Price Index	Market Volatility Index
Q1 2017	-1.5	0.9	0.7	2.4	5.2	1.8	0.1	1.7	2.3	5.6	4.7	3.3	15,960	181	291	37.1
Q2 2017	-2.8	-0.7	-0.6	1.1	5.8	1.8	0.1	1.8	2.4	5.9	4.9	3.3	15,042	179	283	32.7
Q3 2017	-2.0	0.0	-0.5	1.1	6.3	1.8	0.1	1.8	2.5	6.1	5.1	3.3	14,290	176	275	34.4
Q4 2017	-1.5	0.5	-0.5	1.2	6.8	1.8	0.1	1.9	2.5	6.2	5.2	3.2	13,982	173	267	32.0
Q1 2018	-0.5	1.4	0.2	1.9	7.1	1.8	0.1	1.9	2.6	6.0	5.2	3.2	14,367	170	259	28.5
Q2 2018	1.0	3.0	0.6	2.4	7.3	2.0	0.1	1.9	2.7	5.8	5.2	3.2	15,001	166	254	25.8
Q3 2018	1.4	3.3	1.0	2.7	7.4	2.0	0.1	2.0	2.7	5.6	5.1	3.2	15,693	163	250	23.6
Q4 2018	2.6	4.4	1.5	3.4	7.3	2.1	0.1	2.0	2.7	5.4	5.1	3.2	16,603	161	249	21.6
Q1 2019	2.6	4.3	1.6	3.5	7.2	2.1	0.1	2.0	2.7	5.2	5.0	3.2	17,519	161	249	20.1
Q2 2019	3.0	4.6	2.1	3.8	7.1	2.0	0.1	2.0	2.7	5.0	4.9	3.2	18,514	161	251	18.7
Q3 2019	3.0	4.5	2.2	3.8	7.0	2.0	0.1	2.0	2.7	4.8	4.8	3.2	19,243	162	255	18.2
Q4 2019	3.0	4.5	2.1	3.8	6.9	1.9	0.1	2.0	2.7	4.7	4.8	3.2	20,025	163	259	17.6
Q1 2020	3.0	4.5	2.0	3.5	6.8	1.8	0.1	2.0	2.7	4.5	4.7	3.2	20,867	164	262	17.3

"Adverse Scenario":
BBB corporate yield spread is 3.7% at its peak in Q4:2017 when financial conditions are generally at their most acute

Narrative: "The U.S. economy experiences a moderate recession. Real GDP falls slightly more than 2 percent from the pre-recession peak , while the unemployment rate rises steadily, peaking at about 7¾ percent in the third quarter of 2018. The U.S. recession is accompanied by an initial fall in inflation through the third quarter of 2017, with the rate of increase in consumer prices then rising steadily and reaching 2 percent by the middle of 2018. Reflecting weak economic conditions, short-term interest rates in the United States fall and remain near zero for the rest of the scenario period. With the increase in term premiums, 10-year Treasury yields gradually rise to a little less than 2¾ percent by the second half of 2018. Financial conditions tighten for corporations and households during the recession. Spreads between investment-grade corporate bond yields and 10-year Treasury yields widen to about 3¾ percentage points by the end of 2017, while spreads between mortgage rates and 10-year Treasury yields widen to about 2½ percentage points over the same period. Asset prices decline in the adverse scenario accompanied by a rise in equity market volatility. Aggregate house prices and commercial real estate prices experience less sizable but more sustained declines compared to equity prices; house prices fall 12 percent through the first quarter of 2019 and commercial real estate prices fall 15 percent through the fourth quarter of 2018. Following the recession in the United States, real activity picks up slowly at first and then gains momentum; growth in real U.S. GDP accelerates from an increase of 1 percent at an annual rate in the second quarter of 2018 to an increase of 3 percent at an annual rate by the middle of 2019. The unemployment rate declines modestly."

Source: Federal Reserve

Source: 2017 Supervisory Scenarios for Annual Stress Tests Required under the Dodd-Frank Act Stress Testing Rules and the Capital Plan Rule
https://www.federalreserve.gov/publications/2017-june-dodd-frank-act-stress-test-appendix-a-supervisory-scenarios.htm

B. Economic Variables-data deltas to apply to current levels (Including Structured)

	Inputs to Use		
	Adverse: 1 Mo	**Adverse: 3 Mo**	**Adverse: 12 mo**
Real GDP Growth	-1.5	-1.5	-1.5
Nominal GDP Growth	0.9	0.9	0.5
Real Disposable Income Growth	0.7	0.7	-0.5
Nominal Disposable Income Growth	2.4	2.4	1.2

- Use 3 month value for 1 month horizon since CCAR does not prescribe monthly values.

	Deltas to Apply		
	Adverse: 1 Mo	**Adverse: 3 Mo**	**Adverse: 12 mo**
Unemployment	0.2	0.5	2.1
CPI Inflation Rate	-0.5	-1.6	-1.6
3M Treasury	-0.1	-0.3	-0.3
3Y Treasury	0.0	-0.1	0.0
5Y Treasury	0.0	0.0	0.2
7Y Treasury	0.0	0.0	0.2
10Y Treasury	0.0	0.1	0.3
BBB Corporate Yield	0.5	1.5	2.1
Agency MBS 10 Year Yield	0.1	0.3	1.2
Non-Agency MBS 10 Year AA Yield	0.4	1.1	4.1
CMBS 10 Year AA Yield	0.4	1.1	4.2
CLO/CDO 5.5-7 Year AA Yield	0.3	0.8	3.4
ABS -Cards 5 Year AAA Yield	0.1	0.4	1.8
ABS-Auto Near prime 3 year AAA Yield	0.1	0.4	1.7
Mortgage Rate	0.3	0.8	1.3
Prime Rate	-0.1	-0.2	-0.3
Dow Jones	-10.5%	-31.4%	-39.9%
House Price Index	-0.4%	-1.1%	-5.5%
Commercial Real Estate Price Index	-0.3%	-1.0%	-9.2%
VIX	4.9	14.6	9.5

- 1 month delta is 1/3 of 3 month value

C. 2017 CCAR Economic variable delta calculations

Annex 2iii, A

Spreads (%) 2016:Q4 Averages*
0.71
1.27
1.37
1.87
0.45
0.44

*Quarterly averages; Spread to treasuries

2017 CCAR

		12/31/2016	Adverse: Q1	Adverse: Q4
1	Real GDP Growth	3.1	-1.5	-1.5
2	Nominal GDP Growth	6.1	0.9	0.5
3	Real Disposable Income Growth	1.6	0.7	-0.5
4	Nominal Disposable Income Growth	4.5	2.4	1.2
5	Unemployment	4.7	5.2	6.8
6	CPI Inflation Rate	3.4	1.8	1.8
7	3M Treasury	0.4	0.1	0.1
8	3Y Treasury	1.3	1.2	1.3
9	5Y Treasury	1.7	1.7	1.9
10	7Y Treasury	2.0	2.0	2.2
11	10Y Treasury	2.2	2.3	2.5
12	BBB Corporate Yield	4.1	5.6	6.2
13	Agency MBS 10 Year Yield	2.9	3.2	4.1
14	Non-Agency MBS 10 Year AA Yield	3.5	4.5	7.6
15	CMBS 10 Year AA Yield	3.6	4.7	7.8
16	CLO/CDO AA 5.5-7 Year AA Yield	3.8	4.7	7.2
16	ABS -Cards 5 Year AAA Yield	2.1	2.5	3.9
18	ABS-Auto Near prime 3 year AAA Yield	1.7	2.0	3.4
19	Mortgage Rates	3.9	4.7	5.2
20	Prime Rate	3.5	3.3	3.2
21	Dow Jones	$23,277.0	$15,960.0	$13,982.0
22	House Price Index	183.0	181.0	173.0
23	Commercial Real Estate Price Index	294.0	291.0	267.0
24	VIX	22.5	37.1	32.0

3-Month	12-Month
Spreads over horizon (in %)*	
0.92	1.56
2.23	5.10
2.35	5.29
2.65	5.00
0.85	2.04
0.85	2.07

*Spread to treasuries

Annex 2ii. Market Capacity Assumption

Illustrative Example only

Step 1: Estimate Unconstrained Sales Per Day

Insurer A has a $100 billion portfolio of investment-grade corporate bonds, priced at par. Insurer A estimates that it holds approximately 5% of outstanding corporate bonds. In the adverse liquidity stress scenario, Insurer A's unconstrained liquidity stress testing model assumes that it can sell:

Time Horizon	% Able to Be Sold	Sale Price	Total Sale	Sales / Day
First 30 Days	**10%**	**97**	**$9.7 B**	**$440 M**
31-90 Days	**20%**	**94**	**$18.8 B**	**$430 M**
91-365 Days	**50%**	**90**	**$45.0 B**	**$230 M**

Step 2: Add Market Capacity Constraint

Assume the average daily trading volume in the secondary market for investment grade corporate bonds has been $13.0 Billion over the past year. Insurer A estimates that trading volumes would decline by 40% in the adverse liquidity stress scenario to $8.0 B per day.

Since Insurer A is 5% of the market, Insurer A can only trade $400 M per day ($8B x 5%) without paying a significant illiquidity premium and impacting the overall market.

Insurer A then repeats this process for every asset class in its investment portfolio.

Time Horizon	Unconstrained Sales / Day	Market Capacity Assumption	Impact
First 30 Days	**$440 M**	**$400 M**	**($40 M)**
31-90 Days	**$430 M**	**$400 M**	**($30 M)**
91-365 Days	**$230 M**	**$400 M**	**$0**

Annex 2iii, A. Year-end Structured Spread Baseline Values

	Q4 2016 Baseline Spreads (%)	Q4 2021 Spreads (%) Averages*
Agency MBS 10 Year Yield	0.71	0.515
Non-Agency MBS 10 Year AA Yield	1.27	1.002
CMBS 10 Year AA Yield	1.37	1.102
CLO/CDO 5.5-7 Year AA Yield	1.87	1.487
ABS -Cards 5 Year AAA Yield	0.45	0.218
ABS-Auto Near prime 3 Year AAA Yield	0.44	0.233

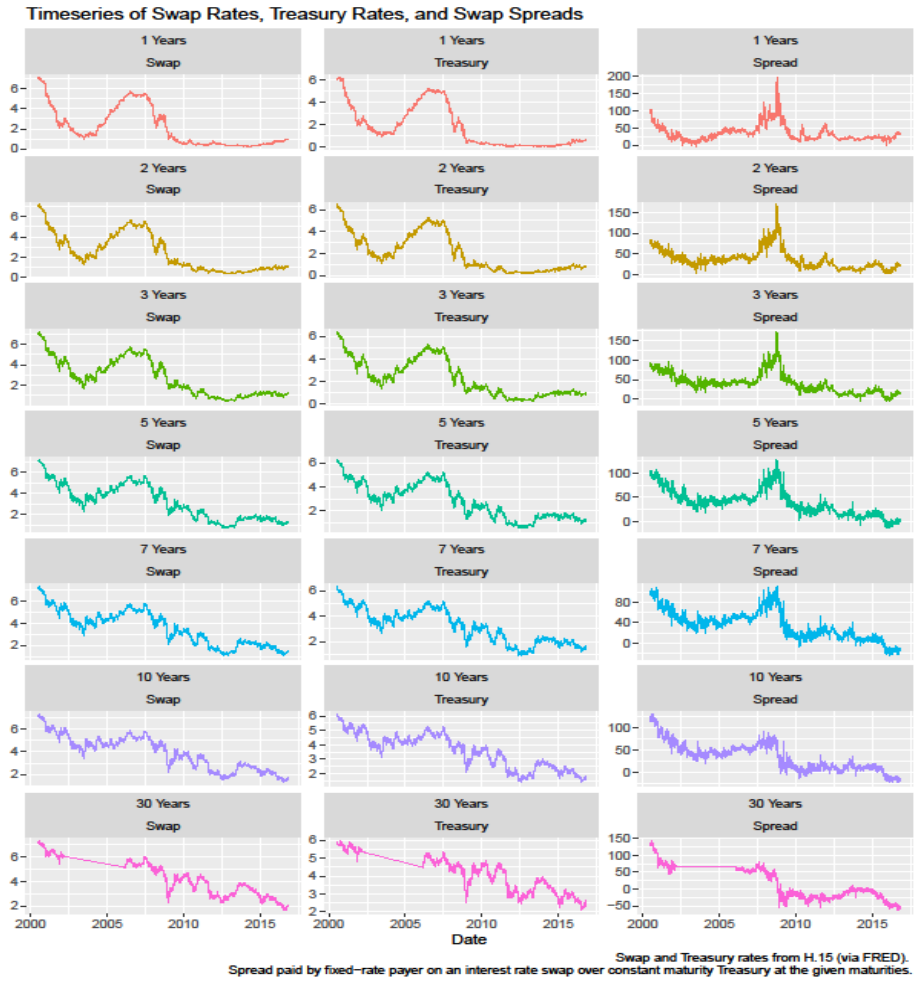
*Quarterly averages;
Spread to treasuries

Commented [ST5]: To be updated as Lead State Guidance in early 2023.

Annex 2iv. SWAP Spread Table

Swap Spreads [1,2]						
Maturity	Baseline	1 Mo.	3 Mo.	6 Mo.	9 Mo.	12 Mo.
3 Mo.	X	X	X	X	X	X
5 Yr	X	X	X	X	X	X
10 Yr	X	X	X	X	X	X
20 Yr	X	X	X	X	X	X
30 Yr	X	X	X	X	X	X

1 - (Nominal) Swap Spreads (in BPS)
2 - IR Par Swap Spreads for USD, EUR, JPY, GBP, AUD and CAD



Source: Federal Reserve

Annex 2v. Implied Volatility of IR Swaptions

Implied Volatility		
Implied Normal Volatility of IR Swaption by Tenor and Expiry		
Time Horizon 0		
Tenor/Expiry	**3Y**	**7Y**
3 Mo.	X	X
3Y	X	X
5Y	X	X
7Y	X	X
10Y	X	X

Annex 2vi. Credit Assumptions: Moody's Transition Matrix/Migration Rates

Exhibit 36. Average one-year alphanumeric rating migration rates, 1983-2021 Back to Table of Contents

Source: Moody's Investors Service

From\To	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca-C	WR	Def
Aaa	87.2%	5.3%	2.2%	0.5%	0.3%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.3%	0.0%
Aa1	1.6%	77.0%	7.8%	5.6%	1.4%	1.0%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.1%	0.0%
Aa2	1.0%	4.2%	74.3%	9.9%	3.3%	1.6%	0.4%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.9%	0.0%
Aa3	0.1%	1.0%	4.0%	75.8%	8.8%	3.4%	0.8%	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.3%	0.0%
A1	0.0%	0.1%	1.0%	5.2%	76.8%	7.5%	2.5%	0.6%	0.4%	0.2%	0.2%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.2%	0.1%
A2	0.0%	0.0%	0.2%	1.0%	5.7%	77.0%	7.2%	2.4%	0.9%	0.3%	0.2%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.5%	0.0%
A3	0.0%	0.0%	0.1%	0.3%	1.4%	6.1%	76.2%	6.7%	2.5%	0.8%	0.3%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.9%	0.1%
Baa1	0.0%	0.0%	0.1%	0.1%	0.2%	1.4%	6.3%	76.8%	6.6%	2.1%	0.5%	0.3%	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	4.8%	0.1%
Baa2	0.0%	0.0%	0.0%	0.1%	0.2%	0.5%	1.8%	6.5%	76.6%	6.2%	1.2%	0.6%	0.4%	0.3%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	5.1%	0.1%
Baa3	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.4%	1.7%	8.7%	73.6%	4.7%	2.0%	0.9%	0.7%	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%	6.0%	0.2%
Ba1	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.6%	2.3%	10.1%	65.4%	5.6%	4.0%	1.5%	0.6%	0.5%	0.1%	0.2%	0.0%	0.1%	7.8%	0.4%
Ba2	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.3%	0.6%	3.6%	8.1%	64.6%	6.4%	3.7%	1.3%	0.9%	0.3%	0.2%	0.1%	0.1%	8.7%	0.6%
Ba3	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.2%	0.1%	0.4%	0.8%	2.8%	6.9%	64.6%	7.0%	3.1%	1.9%	0.7%	0.4%	0.1%	0.1%	9.6%	1.2%
B1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.4%	0.6%	2.8%	6.8%	63.6%	6.4%	4.4%	1.4%	0.7%	0.2%	0.2%	10.3%	1.8%
B2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.2%	0.2%	0.6%	2.1%	7.4%	62.3%	8.0%	3.5%	1.9%	0.4%	0.5%	9.6%	2.7%
B3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.1%	0.2%	0.8%	2.5%	6.2%	60.6%	7.5%	3.3%	1.0%	0.8%	12.3%	4.2%
Caa1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.5%	1.2%	7.4%	59.0%	9.5%	2.8%	1.2%	13.9%	4.0%
Caa2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.3%	0.7%	1.9%	6.6%	58.2%	6.4%	2.9%	15.1%	7.6%
Caa3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.9%	2.9%	9.4%	45.7%	9.0%	14.4%	17.3%
Ca-C	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.3%	1.6%	1.7%	3.2%	5.3%	37.1%	20.1%	30.0%

Source: Moody's

Commented [ST6]: To be updated as Lead State Guidance in early 2023.

Annex 2vii. Credit Assumptions: Moody's Default Table

Exhibit 41. Average cumulative issuer-weighted global default rates by letter rating, 1983-2021 Back to Table of Contents

Source: Moody's Investors Service

Rating\Horizon	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Aa	0.0%	0.1%	0.1%	0.2%	0.3%	0.4%	0.5%	0.6%	0.6%	0.7%	0.8%	0.9%	1.0%	1.1%	1.2%	1.3%	1.4%	1.5%	1.7%	1.8%
A	0.1%	0.2%	0.3%	0.5%	0.7%	1.0%	1.2%	1.5%	1.7%	2.0%	2.2%	2.5%	2.7%	3.0%	3.3%	3.6%	3.9%	4.3%	4.6%	4.9%
Baa	0.1%	0.4%	0.7%	1.0%	1.3%	1.7%	2.1%	2.4%	2.8%	3.2%	3.6%	4.0%	4.5%	5.0%	5.5%	6.0%	6.4%	6.8%	7.2%	7.5%
Ba	0.8%	2.3%	4.0%	5.9%	7.5%	9.1%	10.5%	11.8%	13.1%	14.4%	15.6%	16.8%	17.9%	19.0%	20.1%	21.1%	22.1%	23.0%	23.9%	24.5%
B	3.1%	7.6%	12.2%	16.4%	20.2%	23.5%	26.5%	29.0%	31.4%	33.4%	35.1%	36.7%	38.4%	40.0%	41.5%	42.9%	44.1%	45.4%	46.5%	47.8%
Caa-C	9.3%	16.7%	23.1%	28.6%	33.4%	37.5%	40.8%	43.8%	46.6%	49.0%	50.9%	52.1%	53.2%	53.9%	54.6%	55.4%	56.1%	56.7%	57.5%	58.2%
IG	0.1%	0.2%	0.4%	0.6%	0.8%	1.1%	1.3%	1.6%	1.8%	2.1%	2.3%	2.6%	2.8%	3.1%	3.4%	3.7%	3.9%	4.2%	4.5%	4.8%
SG	4.1%	8.3%	12.3%	15.9%	19.0%	21.7%	24.0%	26.0%	27.9%	29.5%	30.9%	32.2%	33.5%	34.7%	35.8%	36.9%	37.9%	38.8%	39.8%	40.6%
All	1.7%	3.3%	4.8%	6.1%	7.2%	8.1%	8.9%	9.6%	10.2%	10.8%	11.3%	11.7%	12.2%	12.6%	13.1%	13.5%	13.9%	14.3%	14.6%	15.0%

Commented [ST7]: To be updated as Lead State Guidance in early 2023.

Annex 2viii. Credit Assumptions: Moody's Recovery Rate Table

Exhibit 8. Average debt recovery rates measured by ultimate recoveries, 1987-2021

Source: Moody's Investors Service

	Emergence year			Default year		
Priority position	2021	2020	1987-2021	2021	2020	1987-2021
Revolvers	98.4%	79.1%	86.3%	100.0%	83.2%	86.3%
Term Loans	52.3%	50.4%	71.8%	57.7%	49.9%	71.8%
Senior Secured Bonds	65.6%	41.3%	61.5%	81.9%	48.6%	61.5%
Senior Unsecured	40.6%	64.9%	47.4%	26.5%	34.9%	47.4%
Subordinated Bonds	n.a.	0.9%	27.9%	n.a.	0.9%	27.9%

* In 2020, the recovery for the PG&E Corporation bankruptcy heavily skewed the average recovery for the senior unsecured bonds. Excluding PG&E resulted in an average recovery of 10.3%.

Commented [ST8]: To be updated as Lead State Guidance in early 2023.