Oracle Financial Services Liquidity Risk Regulatory Calculations for Monetary Authority of Singapore

User Guide

Release 8.0.7.0.0

Oracle Financial Services Liquidity Risk Regulatory Calculations for Monetary Authority of Singapore

User Guide, Release 8.0.7.0.0

Primary Author: Vineeta Mishra

Contributors: Rishi Anand

TABLE OF CONTENTS

DOCUMENT CONTROL

Version Number	Revision Date	Changes Done
1.0	Created February 2019	This is the first release of LRRCMAS, release 8.0.7.

This document provides a comprehensive knowledge about the regulatory calculations in Oracle Financial Services Liquidity Risk Regulatory Calculations for Monetary Authority of Singapore, Release 8.0.7.0.0. The latest copy of this guide can be accessed from OHC Documentation Library.

ABOUT THE GUIDE

This section provides a brief description of the scope, the audience, the references, the organization of the user guide and conventions incorporated into the user guide. The topics in this section are organized as follows:

- Scope of the guide
- Intended Audience
- Documentation Accessibility
- Related Information Sources

SCOPE OF THE GUIDE

The objective of this user guide is to provide a comprehensive knowledge about the regulatory calculations supported in the Oracle Financial Services Liquidity Risk Regulatory Calculations for Monetary Authority of Singapore, Release 8.0.7.0.0. This document is intended to help you understand the methodologies involved in computation of LCR, NSFR, MLA ratio and other regulatory metrics and computations.

This User Guide should be used in conjunction with the documents listed in the section Related Information Sources in order to get a complete view of how the general capabilities of OFS Liquidity Risk Regulatory Calculations for Monetary Authority of Singapore (LRRCMAS) have been leveraged, and the configurations required for the purposes of addressing the regulatory requirements.

INTENDED AUDIENCE

Welcome to Release 8.0.7.0.0 of the Oracle Financial Services Liquidity Risk Regulatory Calculations for Monetary Authority of Singapore. This manual is intended for the following audience:

- Business Users: This user reviews the functional requirements and information sources, such as reports.
- Strategists: This user identifies strategies to maintain an ideal liquidity ratio and liquidity gap, based on the estimated inflow and outflow of cash.
- Data Analysts: This user would be involved with cleaning, validation, and importing of data into the OFSAA Download Specification format.

DOCUMENTATION ACCESSIBILITY

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info

Or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Related Information Sources

You can access the below documents online from the Oracle Help Center (OHC) documentation Library for OFS Liquidity Risk Solution (LRS) 8.x:

- OFS Liquidity Risk Solution Application Pack 8.0.7.0.0 Release Notes
- OFS Liquidity Risk Solution Application Pack 8.0.7.0.0 Installation Guide
- OFS Liquidity Risk Measurement and Management Release 8.0.7.0.0 Analytics User Guide
- OFS Liquidity Risk Measurement and Management Release 8.0.7.0.0 User Guide

You can access the OFS AAI documentation online from the OHC Documentation Library for OFS AAAI 8.x:

- OFS Advanced Analytical Applications Infrastructure (OFS AAAI) Application Pack Installation and Configuration Guide
- OFS Analytical Applications Infrastructure User Guide

The additional documents are:

- OFSAA Licensing User Manual, Release 8.0.7.0.0
- OFS Analytical Applications Infrastructure Security Guide
- OFSAAI FAQ Document
- OFS Analytical Applications 8.0.7.0.0 Technology Matrix

ABBREVIATIONS

Abbreviation	Description
LRS	Liquidity Risk Solution
LRMM	Liquidity Risk Measurement and Management
LRRCMAS	Liquidity Risk Regulatory Calculations for Monetary Authority of Singapore
LRRCEBA	Liquidity Risk Regulatory Calculations for European Banking Authority
LRRCRBI	Liquidity Risk Regulatory Calculations for Reserve Bank of India
LRRCUSFED	Liquidity Risk Regulatory Calculations for US Federal Reserve
DICLRM	Deposit Insurance Calculations for Liquidity Risk Management
DPA	Deposit Protection Agency
OFS	Oracle Financial Services

Release Highlights

This is the first release of Liquidity Risk Regulatory Calculations for Monetary Authority of Singapore.

It includes the following features:

- Liquidity Coverage Ratio (LCR) calculation as per guidelines specified by Monetary Authority of Singapore
- Net Stable Funding Ratio (NSFR) calculation per guidelines specified by Monetary Authority of Singapore
- Minimum Liquid Assets (MLA) Ratio per guidelines specified by Monetary Authority of Singapore

1 Introduction

Various parameters in Liquidity Risk Management help in analyzing the liquidity status of the bank. Liquidity ratios are one such parameter prescribed by the Basel III Guidelines. Oracle Financial Services Liquidity Risk Regulatory Calculations for Monetary Authority of Singapore (LRRCMAS) application calculates the following two types of ratios:

- **Liquidity Coverage Ratio (LCR)**: Liquidity coverage ratio addresses the short-term liquidity needs of a bank, or financial institution during a stress situation. It estimates whether the stock of high quality liquid assets is sufficient to cover the net cash outflows under stress situations over a specified future period, in general, lasting 30 calendar days (or LCR horizon). LCR is calculated at the legal entity level, on a standalone and consolidated basis.
- **Net Stable Funding Ratio (NSFR)**: Net Stable Funding Ratio addresses the medium and long-term liquidity needs of a bank, or financial institution during a stress situation. It specifies the minimum amount of stable funding required to be maintained in order to promote stable long term funding.
- **Minimum Liquid Assets (MLA):** Minimum Liquid Asset addresses the liquidity needs of a bank or financial institution that are neither headquartered in Singapore, nor are domestic systematically important banks.

2 Liquidity Coverage Ratio Calculation

LCR is the first standard which assesses the short term liquidity challenges of a bank.

2.1 Inputs

The LRRCMAS application requires the below inputs for LCR calculation:

- Liquidity haircut for each asset level should be provided through business assumptions, with assumption category as valuation change, and assumption sub category as haircut.
- Business assumption which defines the outflow percentage should be defined through appropriate business assumptions. For example, Retail Deposit Run off is defined through a business assumption with assumption category as Incremental Cash Flow, and sub category as Run-off.
- Business assumption which defines the inflow percentage should be defined through appropriate business assumptions. For example, Roll over reverse repo is defined through a business assumption with assumption category as Cash Flow Movement, and sub category as Roll Over.
- Liquidity Horizon is specified as the Run time parameter.

2.2 Process Flow

The application supports an out-of-the-box MAS LCR, which has the regulatory scenario with associated HQLA haircuts, inflow and outflow percentage / rates pre-configured in the form of rules and business assumptions.

- Asset Level Identification
- Identification of Eligible HQLA
- Calculation of Stock of High Quality Liquid Asset
- Determination of Maturity of Cash Flows
- Insurance Allocation
- Identification of Deposit Stability
- Identification and Treatment of Pledged Deposits
- Secured Funding
- Classification of Operational Deposits
- Calculation of Contractually Required Collateral
- Calculation of Excess Collateral

2.2.1 Asset Level Identification

All assets, whether owned by the bank or received from counterparties as collateral, that meet the high quality liquid asset criteria specified by MAS, are classified as follows:

- Level 1 Assets
- Level 2A Assets
- Level 2B(I) Assets
- Level 2B(II) RMBS Assets
- Level 2B(II) non-RMBS Assets

Level 1 assets can be included in the stock of HQLA without limit and Level 2 assets can only comprise 40% of the stock of HQLA. Of this, Level 2B and Level 2B(II) assets can only comprise of 15% and 5% of stock of HQLA, respectively. Any asset not classified as an HQLA is considered an Other Asset.

2.2.1.1 Identification and Treatment of Level 1 Assets

Level 1 assets are assets which qualify to be fully included as part of the stock of high quality liquid assets computing LCR:

1. Cash which includes coins, bank notes and restricted cash. The value included in the stock of HQLA is the cash balance.
2. Central bank reserves (including excess and required reserves), to the extent that the central bank policies allow them to be drawn down in times of stress. These include:
   a. Banks’ overnight deposits with the central bank
   b. Term deposits with the central bank that satisfy the following conditions:
      - They are explicitly and contractually repayable on notice from the depositing bank

  - They constitute a loan against which the bank can borrow on a term basis or on an overnight but automatically renewable basis (only where the bank has an existing deposit with the relevant central bank)

   The value of eligible term deposits that is included is the amount net of any withdrawal penalty.

3. Sukuk issued by Singapore Sukuk Pte. Ltd.
4. Marketable securities, assigned a 0% risk-weight, which satisfy the following conditions:
   - Issuer type or Guarantor type is one of the following:
     - Sovereign
     - Central Bank
     - Public Sector Entity
     - Regional Government, Municipalities, and State Agencies
     - Multi-lateral Development Bank
     - The Bank For International Settlements (BIS)
     - The International Monetary Fund
     - The European Central Bank and European Commission
   - Not an obligation of a financial institution or any of its affiliated entities
5. Debt securities issued in domestic currencies in the country in which the liquidity risk is being taken or in the bank's home country where the issuer type is sovereign or central bank and the risk weight assigned to the issuer is greater than 0%.
6. Debt securities issued in foreign currencies are eligible up to the amount of the bank's stressed net cash outflows in that specific foreign currency stemming from the bank's operations in the country in which the liquidity risk is being taken or in the bank's home country where the issuer type is sovereign or central bank and the risk weight assigned to the issuer is greater than 0%.

2.2.1.2 Identification and Treatment of Level 2A Assets

The application identifies the following as HQLA Level 2A assets.

1. Marketable securities, assigned a 20% risk-weight, which satisfy the following conditions:
   - Issuer type or Guarantor Type is one of the following:
     - Sovereign
     - Central Bank
     - Public Sector Entity

    - Regional Government, Municipalities, and State Agencies
    - Multi-lateral Development Bank
  - Price has not decreased, or haircut has not increased by more than 10% over a 30-day period during a relevant period of significant liquidity stress which is specified by the bank.
  - Not an obligation of a financial institution or any of its affiliated entities.

2. Debt securities (including commercial paper) issued by corporates, Sukuk issued by institution other than Singapore Sukuk Pte Ltd. and covered bonds, which satisfy the following conditions:
   - Issuer type is not the bank itself for which the computations are being carried out or any of its affiliated entities
   - Assigned a rating equal to or greater than AA- or,
   - Price has not decreased or haircut has not increased by more than 10% over a 30-day period during a relevant period of significant liquidity stress which is specified by the bank.
   - For corporate debt securities, issuer type is not a financial institution or its affiliated entities

2.2.1.3 Identification and Treatment of Level2B(I) Assets

The application identifies the following as HQLA Level 2B(I) assets:

1. Debt securities (including commercial paper) issued by corporates, and Sukuk issued by institutions other than Singapore Sukuk Pte Ltd. satisfying the following conditions:
   - Issuer type is not the bank itself for which the computations are being carried out or any of its affiliated entities.
   - Assigned a rating between A+ to A-
   - Price has not decreased or haircut has not increased by more than 20% over a 30-day period during a relevant period of significant liquidity stress which is specified by the bank.
   - For corporate debt securities, issuer type is not a financial institution or its affiliated entities

2.2.1.4 Identification and Treatment of Level 2B(II) RMBS Assets

The application identifies the Residential Mortgage Backed Securities (RMBS) satisfying the conditions listed below as HQLA Level 2B(II) RMBS assets:

- Issuer type is not the bank for which the computations are being carried out or any of its affiliated entities.
- Issuer type of the underlying assets is not the bank itself for which the computations are being carried out or any of its affiliated entities.
- Assigned a rating equal to or greater than AA

- Price has not decreased or haircut has not increased by 20% over a 30-day period during a relevant period of significant liquidity stress specified by the bank.
- The underlying asset pool consists of residential mortgages only, and does not contain any structured products.
- The underlying mortgages are "full recourse'' loans, and have a maximum Loan-To-Value ratio (LTV) of less than or equal to 80%
- The securitizations are subject to "risk retention" regulations which require issuers to retain an interest in the assets they securitize.

2.2.1.5 Identification and Treatment of Level 2B(II) Non-RMBS Assets

The application identifies the following assets as HQLA Level 2B (II) Non-RMBS assets:

1. Marketable securities which satisfy the following conditions:
   - Issuer type is not a financial institution or its affiliated entities.
   - Issuer and guarantor type is a Sovereign or Central Bank
   - Assigned a rating between BBB+ and BBB-
   - Price has not decreased, or haircut has not increased by more than 20% over a 30-day period during a relevant period of significant liquidity stress which is specified by the bank.
2. Debt securities issued by corporates, and Sukuk issued by institutions other than Singapore Sukuk Pte Ltd, which satisfy the following conditions:
   - Issuer type is not a financial institution or its affiliated entities (in case of corporate debt securities)
   - Assigned a rating between BBB+ and BBB-
   - Price has not decreased or haircut has not increased by more than 20% over a 30-day period, during a relevant period of significant liquidity stress which is specified by the bank.
3. Common equities which satisfy the following conditions:
   - Issuer type is not a financial institution or its affiliated entities.
   - Are exchange traded and centrally cleared.
   - Are a constituent of the major stock index in the legal entity's home jurisdiction, or where the liquidity risk is taken, as decided by the supervisor in the jurisdiction where the index is located.
   - Are denominated in the domestic currency of the legal entity's home jurisdiction or in the currency of the jurisdiction where the liquidity risk is taken.

- Price has not decreased or haircut has not increased by more than 40% over a 30-day period during a relevant period of significant liquidity stress specified by the bank.

NOTE: The value of eligible securities included in the HQLA is the market value less hedge termination cost, if any.

2.2.2 Identification of Eligible HQLA

The application identifies whether a bank's asset, or a mitigant received under re-hypothecation rights meets all the operational requirements prescribed by MAS. If an asset classified as HQLA meets all the relevant operational criteria it is identified as eligible HQLA and included in the stock of HQLA.

The application checks for the following operational criteria:

a. Operational Capability to Monetize HQLA

An asset is considered HQLA only if the bank has demonstrated the operational capability to monetize such an asset and has periodically monetized such an asset. The application captures this information for each asset as a flag.

b. Unencumbered

The application looks at the encumbrance status and includes only those assets in the stock which are unencumbered. If partially encumbered, then the portion of the asset that is unencumbered is considered as HQLA and included in the stock. If an asset is pledged to the central bank or a PSE, but is not used, the unused portion of such an asset is included in the stock. The application assigns the usage of a pledged asset in the ascending order of asset quality i.e. the lowest quality collateral is marked as used first.

c. HQLA Under the Control of the Liquidity Management Function

To be considered eligible HQLA the asset are under the control of the management function of the bank that manages liquidity. The application captures this information for each asset as a flag.

d. Termination of Transaction Hedging HQLA

If a HQLA is hedged by a specific transaction, then the application considers the impact of closing out the hedge to liquidate the asset that is, the cost of terminating the hedge while computing the stock of HQLA. The hedge termination cost is deducted from the market value of the asset and the difference is included in the stock of HQLA.

e. Transferability Restriction during Consolidation

Surplus HQLA held by a subsidiary can be included in the stock of the parent company only if it is freely available to the parent during times of stress. The assets that have transfer restrictions are identified through a flag. The application only includes the restricted assets to the extent required to cover the subsidiary's own net cash outflows while including the unrestricted assets fully into the consolidated stock of HQLA.

f. Exclusion of Certain Re-hypothecated Assets

Any asset that a bank receives under a re-hypothecation right is not considered eligible HQLA if the counterparty or beneficial owner of the asset has a contractual right to withdraw the asset at any time within 30 calendar days.

g. Unsegregated Assets

The application includes unsegregated assets, received as collateral under re-hypothecation rights, for derivative transactions, in the stock of HQLA. Conversely, it excludes all segregated assets from the stock of HQLA.

2.2.3 Calculation of Stock of High Quality Liquid Asset

SHQLA is calculated at legal entity and currency granularity. This is performed by the rule LRM - Stock of High Quality Liquid Asset Computation.

All unencumbered assets classified as Level 1, 2A or 2B, which meet the HQLA eligibility criteria, are included in the stock of high quality liquid assets (SHQLA). The formula for calculating SHQLA is as follows:

$$\textit{Stock of HQLA} = \textit{Unadjusted Level 1 HQLA} + \textit{Unadjusted Level 2A HQLA} + \textit{Unadjusted Level 2B(I) HQLA} + \textit{Unadjusted Level 2B(II) HQLA} - \textit{Adjustment due to Cap on } 5\% \textit{ Level } 2B(II) \textit{ HQLA} - \textit{Adjustment due to Cap on } 15\% \textit{ Level } 2B \textit{ HQLA} - \textit{Adjustment due to Cap on } 40\% \textit{ Level } 2 \textit{ HQLA}$$

Where:

Adjustment for 5% Level 2B(II) HQLA cap = MAX [Adjusted Level 2B(II) HQLA - (5/95){Adjusted Level 1 HQLA + Adjusted Level 2A HQLA + Adjusted Level 2B(I)HQLA}*

, Adjusted Level 2B(II) HQLA - (5/85){Adjusted Level 1HQLA + Adjusted Level 2A HQLA}*

*, Adjusted Level 2B(II) HQLA - (5/60)*Adjusted Level 1 HQLA,0]*

Adjustment for 15% Level 2B HQLA cap = MAX [{Adjusted Level 2B(I) HQLA+ Adjusted Level 2B(II) HQLA – Adjustment for 5% Level 2B(II) HQLA cap}

- (15/85)(Adjusted Level 1 HQLA + Adjusted Level 2A HQLA)*

*,Adjusted Level 2B(I) HQLA+ Adjusted Level 2B(II) HQLA – Adjustment for 5% Level 2B(II) HQLA cap - (15/60)*Adjusted Level 1 HQLA,0]*

Adjustment for 40% Level 2 HQLA cap = MAX [{Adjusted Level 2A HQLA + Adjusted Level 2B(I) HQLA + Adjusted Level 2B(II) HQLA

*- Adjustment for 5% Level 2B(II) HQLA cap - Adjustment for 15% Level 2B(I) HQLA cap} - (2/3)*Adjusted Level 1 HQLA,0]*

The application applies the relevant liquidity haircuts to the market value of each eligible HQLA based on the haircuts specified as part of a business assumption. The sum of haircut adjusted market value of all assets which are not ‘other assets’ and which are classified as ‘eligible HQLA’ comprises of the stock of HQLA. The stock includes bank’s own assets which are unencumbered, i.e. not placed as collateral; as well assets received from counterparties where the bank has a re-hypothecation right and where such assets are not re-hypothecated.

NOTE: All calculations are based on the market value of assets.

2.2.3.1 Calculation of Stock of Liquid Assets

1. Calculation of Stock of Level 1 Assets
   The stock of level 1 assets equals the market value of all level 1 liquid assets held by the bank as of the calculation date that are eligible HQLA, less the amount of the minimum reserves less hedge termination costs (if any), less withdrawal penalty on time deposits (if any).
2. Calculation of Stock of Level 2A Assets

   The stock of level 2A liquid assets equals 85 percent of the market value of all level 2A liquid assets held by the bank as of the calculation date that are eligible HQLA, less hedge termination costs (if any).
3. Calculation of Stock of Level 2B(I) Assets

The stock of level 2B(I) liquid assets equals 50 percent of the market value of all level 2B(I) liquid assets held by the bank as of the calculation date that are eligible HQLA, less hedge termination costs (if any).

4. Calculation of Stock of Level 2B(II) RMBS Assets

   The stock of level 2B (II) RMBS liquid asset amount equals 75 percent of the market value of all level 2B RMBS liquid assets held by the bank as of the calculation date that are eligible HQLA, less hedge termination costs (if any).

5. Calculation of Stock of Level 2B(II) Non-RMBS Assets

   The stock of level 2B(II) liquid assets equals 50 percent of the market value of all level 2B non-RMBS liquid assets held by the bank as of the calculation date that are eligible HQLA, less hedge termination costs (if any).

2.2.3.2 Identification of Eligible HQLA on Unwind

The application identifies the assets that are placed as collateral which are eligible HQLA if they are not encumbered. Placed collateral is marked as eligible HQLA on unwind if it fulfills all of the following criteria:

- Asset Level is level 1, level 2A, level 2B (I), level 2B (II) RMBS, or level 2B (II) non-RMBS asset
- Meets HQLA Operational Requirements on Unwind

2.2.3.3 Unwinding of Transactions Involving Eligible HQLA

The application identifies all transactions maturing within the LCR horizon where HQLA is placed or received. These transactions include repos, reverse repos, secured lending transactions, collateral swaps and so on. Such transactions are to be unwound that is, the original position is to be reversed and the cash or stock of HQLA is adjusted accordingly. This is done to avoid inclusion of any asset in the stock that may have to be returned to its owner before the end of the LCR horizon. The unwinding of transactions results in adjustments to the stock of HQLA, i.e. additions to or deductions from the stock of HQLA.

2.2.3.4 Calculation of Adjusted Stock of HQLA

1. Adjusted Stock of Level 1 Assets

   The formula for calculating adjusted stock of level 1 assets is as follows:

$$\begin{aligned}&\textit{Adjusted Stock of Level } 1 \textit{ Assets}\\&\quad = \textit{Post Haircut Stock of Level } 1 \textit{ Assets}\\&\quad + \textit{Post Haircut Adjustments to Stock of Level } 1 \textit{ Assets}\end{aligned}$$

Note: Adjustments relate to the cash received or paid and the eligible level 1 assets posted or received as collateral or underlying assets as part of a secured funding transaction, secured lending transaction, asset exchanges, or collateralized derivatives transaction.

2. Adjusted Stock of Level 2A Assets

   The formula for calculating adjusted stock of level 2A assets is as follows:

$$\begin{aligned}&\boldsymbol{Adjusted\ Stock\ of\ Level\ 2A\ Assets}\\&\quad= \boldsymbol{Post - Haircut\ Level\ 2A\ Assets}\\&\quad+ \boldsymbol{Post\ Haircut\ Adjustments\ to\ Stock\ of\ Level\ 2A\ Assets}\end{aligned}$$

Note: Adjustments relate to eligible level 2A assets posted or received as collateral or underlying assets as part of a secured funding transaction, secured lending transaction, asset exchanges, or collateralized derivatives transaction.

3. Adjusted Stock of Level 2B (I) Assets

   The formula for calculating adjusted stock of level 2B (I) assets is as follows:

$$\begin{aligned}&\boldsymbol{Adjusted\ Stock\ of\ Level\ 2B\ (I) Assets}\\&\quad= \boldsymbol{Post - Haircut\ Stock\ of\ Level\ 2B\ (I) Assets}\\&\quad+ \boldsymbol{Post\ Haircut\ Adjustments\ to\ Stock\ of\ Level\ 2B\ (I) Assets}\end{aligned}$$

Note: Adjustments relate to eligible level 2B (I) assets posted or received as collateral or underlying assets as part of a secured funding transaction, secured lending transaction, asset exchanges, or collateralized derivatives transaction.

4. Adjusted Stock of Level 2B (II) RMBS Assets

   The formula for calculating adjusted stock of level 2B (II) RMBS assets is as follows:

$$\begin{aligned}&\boldsymbol{Adjusted\ Stock\ of\ Level\ 2B\ (II)\ RMBS\ Assets}\\&\quad= \boldsymbol{Post - Haircut\ Stock\ of\ Level\ 2B\ (II) RMBS\ Assets}\\&\quad+ \boldsymbol{Post\ Haircut\ Adjustments\ to\ Stock\ of\ Level\ 2B\ (II)\ RMBS\ Assets}\end{aligned}$$

Note: Adjustments relate to eligible level 2B (II) RMBS assets posted or received as collateral or underlying assets as part of a secured funding transaction, secured lending transaction, asset exchanges, or collateralized derivatives transaction.

5. Adjusted Stock of Level 2B (II) Non-RMBS Assets

   The formula for calculating adjusted stock of level 2B (II) non-RMBS assets is as follows:

$$\begin{aligned}&\boldsymbol{Adjusted\ Stock\ of\ Level\ 2B\ (II) Non - RMBS\ Assets}\\&\quad= \boldsymbol{Post - Haircut\ Stock\ of\ Level\ 2B\ (II)\ Non - RMBS\ Assets}\\&\quad+ \boldsymbol{Post\ Haircut\ Adjustments\ to\ Stock\ of\ Level\ 2B\ (II)\ Non}\\&\quad- \boldsymbol{RMBS\ Assets}\end{aligned}$$

Note: Adjustments relate to eligible level 2B Non-RMBS assets posted or received as collateral or underlying assets as part of a secured funding transaction, secured lending transaction, asset exchanges, or collateralized derivatives transaction.

2.2.3.5 Calculation of Adjustments to Stock of HQLA Due to Cap on Level 2 Assets

1. Adjustment Due to Cap on Level 2B(II) Assets

Level 2B(II) assets can only constitute up to 5% of the stock of HQLA after taking into account the impact of unwinding transactions maturing within the LCR horizon. Adjustment to stock of HQLA due to cap on Level 2B (II) assets is calculated as follows:

$$\begin{aligned}&\boldsymbol{Adjustment\ due\ to\ Cap\ on\ Level\ 2B\ (II)\ Assets}\\&= \boldsymbol{Maximum}\Bigg[\Bigg\{\boldsymbol{Adjusted\ Level\ 2B\ (II) Assets}\\&- \Bigg(\frac{\mathbf{5}}{\mathbf{95}}\\&\times (\boldsymbol{Adjusted\ Level\ 1\ Assets} + \boldsymbol{Adjusted\ Level\ 2A\ Assets}\\&+ \boldsymbol{Adjusted\ Level\ 2B\ (I)\ Assets})\Bigg)\Bigg\}, \Bigg\{\boldsymbol{Adjusted\ Level\ 2B\ (II) Assets}\\&- \Bigg(\frac{\mathbf{5}}{\mathbf{85}}\\&\times (\boldsymbol{Adjusted\ Level\ 1\ Assets}\\&+ \boldsymbol{Adjusted\ Level\ 2A\ Assets})\Bigg)\Bigg\}, \Bigg\{\boldsymbol{Adjusted\ Level\ 2B\ (II)\ Assets}\\&- \left(\frac{\mathbf{5}}{\mathbf{60}} \times \boldsymbol{Adjusted\ Level\ 1\ Assets}\right)\Bigg\}, \mathbf{0}\Bigg]\end{aligned}$$

2. Adjustment Due to Cap on Level 2B Assets

Level 2(B) assets can only constitute up to 15 % of the stock of HQLA after taking into account the impact of unwinding transactions maturing within the LCR horizon. Adjustment to Stock of HQLA due to cap on Level 2B assets is calculated as follows:

$$\begin{aligned}&\boldsymbol{Adjustment\ due\ to\ Cap\ on\ Level\ 2B\ Assets}\\&= \boldsymbol{Maximum}\Bigg[\Bigg\{\boldsymbol{Adjusted\ Level\ 2B\ (I) Assets}\\&+ \boldsymbol{Adjusted\ Level\ 2B(II) Assets}\\&- \boldsymbol{Adjustment\ due\ to\ Cap\ on\ Level\ 2B(II) Assets} - \left(\frac{\mathbf{15}}{\mathbf{85}}\right)\\&\times \begin{pmatrix}\boldsymbol{Adjusted\ Level\ 1\ Assets}\\ +\boldsymbol{Adjusted\ Level\ 2A\ Assets}\end{pmatrix}, \boldsymbol{Adjusted\ Level\ 2B(I) Assets}\\&+ \boldsymbol{Adjusted\ Level\ 2B(II) Assets}\\&- \boldsymbol{Adjustment\ due\ to\ Cap\ on\ Level\ 2B(II) Assets}\\&- \left(\frac{\mathbf{15}}{\mathbf{60}} \times \boldsymbol{Adjusted\ Level\ 1\ Assets}\right)\Bigg\}, \mathbf{0}\Bigg]\end{aligned}$$

3. Adjustment Due to Cap on Level 2 Assets

Level 2 assets can only constitute up to 40% of the stock of HQLA after taking into account the impact of unwinding transactions maturing within the LCR horizon. Adjustment to Stock of HQLA due to cap on Level 2 assets is calculated as follows:

$$\begin{aligned}\boldsymbol{Adjustment\ due\ to\ Cap\ on\ Level\ 2\ Assets} &= \boldsymbol{Maximum}\Big[\Big\{\boldsymbol{Adjusted\ Level\ 2A\ Assets} + \boldsymbol{Adjusted\ Level\ 2B\ (I) Assets} \\ &+ \boldsymbol{Adjusted\ Level\ 2B\ (II) Assets} \\ &- \boldsymbol{Adjustment\ due\ to\ Cap\ on\ Level\ 2B\ (II)\ Assets} \\ &- \boldsymbol{Adjustment\ due\ to\ Cap\ on\ Level\ 2B\ (I)\ Assets} \\ &- \left(\frac{\boldsymbol{2}}{\boldsymbol{3}} \times \boldsymbol{Adjusted\ Level\ 1\ Assets}\right)\Big\}, \boldsymbol{0}\Big]\end{aligned}$$

2.2.4 Determination of the Maturity of Cash Flows

For the purposes of calculating the Liquidity Coverage Ratio, the application identified the maturity of certain transactions as follows:

1. For liabilities having embedded optionality, such as callable features, that reduces the maturity of the account, the application considers the earliest date, i.e. the first call date, as the revised maturity date.
2. For assets having embedded optionality that reduces the maturity of the account, where the collateral received is not re-hypothecated, the application considers the earliest date, i.e. the first call date, plus notice period as the revised maturity date.
3. For derivatives having embedded optionality that reduces the maturity of the account, where the collateral received is not re-hypothecated, the application considers the earliest date, i.e. the first call date, as the revised maturity date.
4. For assets or derivatives, where the collateral received has been re-hypothecated for a period greater than the maturity of the asset itself, the application considers the maturity date of the liability, against which the collateral received is re-hypothecated, as the revised maturity of the asset.
5. For assets or derivatives having embedded optionality that reduces the maturity of the account, where the collateral received has been re-hypothecated for a period greater than the first call date plus notice period but less than the original maturity of the asset itself, the application considers the maturity date of the liability, against which the collateral received is re-hypothecated, as the revised maturity of the asset.
6. For derivatives having embedded optionality that reduces the maturity of the account, where the collateral received has been re-hypothecated for a period greater than the first call date but less than the original maturity of the asset itself, the application considers the maturity date of the liability, against which the collateral received is re-hypothecated, as the revised maturity of the asset.

7. For assets having embedded optionality that reduces the maturity of the account, where the collateral received has been re-hypothecated for a period less than the first call date plus notice period, the application considers the first call date plus notice period as the revised maturity of the asset.
8. For derivatives having embedded optionality that reduces the maturity of the account, where the collateral received has been re-hypothecated for a period less than the first call date plus notice period, the application considers the first call date as the revised maturity of the asset.
9. For assets and derivatives which do not have embedded optionality that reduces the maturity of the account, where the collateral received has been re-hypothecated for a period less than the maturity of the asset itself, the application considers the original maturity date of the asset, as the revised maturity of the asset.
10. For assets and derivatives which do not have embedded optionality that reduces the maturity of the account, where the collateral received has not been re-hypothecated, the application considers the original maturity date of the asset, as the revised maturity of the asset.

NOTE: The revised maturity is computed by the application as per regulatory expectation and is used for the calculation of LCR.

2.2.5 Insurance Allocation

The steps involved in insurance allocation are:

- Identification of Insurance Eligible Accounts
- Allocation of Deposit Insurance

2.2.5.1 Identification of Insurance Eligible Accounts

The identification of insurance eligible accounts involves looking at the inclusion as well as the exclusion criteria. The application requires users to provide the following inclusion criteria:

1. **Ownership Category**

There are three ownership categories available in LRRCMAS:

- SDIC-DI: Ownership categories include single accounts, joint accounts, sole proprietorship, trusts and company.
- SDIC-CPFRS: Ownership categories includes CPF Retirement Sum Scheme (CPFRS).
- SDIC-CPFIS: Ownership categories includes CPF Investment Scheme (CPFIS).

As per Singapore Deposit Insurance Corporation (SDIC), a separate limit is assigned to a depositor combination based on the ownership category of accounts and hence users are required to provide the ownership categories that get a separate limit. If a particular customer gets a single limit irrespective of whether the accounts are held as single, joint or a combination, the ownership category should have a single default value.

2. **Product Type**

   This is a list of product types that are covered under the respective jurisdiction's deposit insurance scheme. The insurance limit is allocated to only those accounts of a customer whose product types matches those that are covered by the deposit insurance. In case of Singapore, SDIC Deposit Insurance covers all types of deposits such as current accounts, savings accounts and term deposits, which need to be provided as inputs.

3. **Product Type Prioritization**

   The sequence in which the insured amount is to be allocated to each product type is captured. For instance, the product prioritization may be specified as current account, savings account and term deposit. This indicates that the insured amount is allocated first to a current account held by the customer. After current accounts have been fully covered, the remaining amount is allocated to savings accounts and finally to term deposits.

NOTE: In case product type prioritization is not specified, the default allocation will be proportionate to the EOP balance of each account irrespective of the product type.

4. **Currency Eligibility for Insurance**

   This is a list of currencies in which the accounts are denominated that are eligible for insurance coverage under a deposit insurance scheme. Some jurisdictions cover foreign currency deposits under their deposit insurance schemes. If eligible currencies are specified for the purpose of insurance, then the insured balance is allocated to all accounts belonging to the particular legal entity which have the associated attributes required for assigning the insured balance. For instance, if SDIC Deposit Insurance insures only Singapore Dollar denominated deposits. The eligible currency against SDIC Deposit Insurance should be provided as Singapore Dollar.

   The application includes insurance exemption criteria covering deposits of foreign sovereigns, central and state governments, and banks and so on. The deposits that are eligible for insurance under a particular insurance scheme are identified based on the inclusion and exclusion criteria as specified by the users.

2.2.5.2 Allocation of Deposit Insurance

As part of the MAS Run, the application allocates the deposit insurance to accounts based on the guidelines specified by the SDIC Deposit Insurance. The insurance limit captured against each deposit insurance scheme is allocated to the insurance eligible accounts under that scheme based on the ownership category and the depositor combination.

The insurance limit, that is the maximum deposit balance covered by an insurance scheme per customer, is captured against each insurance scheme – ownership category combination.

Customers having account in multiple legal entities get a separate deposit insurance limit per legal entity. In case of SDIC Deposit Insurance scheme, the limit amount needs to be provided in Stage Insurance Scheme Master table at the granularity of insurance scheme.

The insurance limit is allocated to accounts as per the procedure given below:

1. The application identifies the established relationship flag at a customer level.
2. The accounts are sorted by the specified product type prioritizations.
3. The insurance allocation is done based on the principal balance from the highest to the least, in the order of product type prioritization.
4. The insurance limit available, is allocated to account 1 to n – 1 as per the formula given below:

$$\boldsymbol{Insured\ Amount} = \boldsymbol{If}\ [\{(\boldsymbol{Insurance\ Limit\ Available} - \boldsymbol{Outstanding\ Balance}) \geq \boldsymbol{0}\}; \boldsymbol{Outstanding\ Balance\ else\ 0}]$$

Where,

Insurance Limit Available	:	Limit available post allocation to previous accounts
	=	Insurance Limit Available$_{x-1}$ – Insured Amount $_{x-1}$
x	:	Number of accounts up to the current account to which insured amount is to be allocated
n	:	Total number of accounts of a customer which are eligible for insurance coverage under a given ownership category

5. The remaining available insurance is allocated to the last account i.e. account n for which insurance was not allocated.
6. If insurance limit is available after allocating to the principal balances, it is allocated to the accrued interest from the highest to the least in the order of Product Type prioritization.

An illustration of this procedure is provided below considering a insurance limit of 50,000 Singapore Dollar (SGD) for each depositor combination under each ownership category for each legal entity as mentioned below.

Note:

- For Single, Joint and Sole proprietorship category, insurance limit is aggregated for each customer per legal entity.
- Each account holder in joint ownership category has equal share for insurance calculation until specifically provided by the legal entity.
- Trusts with distinct account number are treated separately. Trust accounts are insured on a per account –beneficiary basis without aggregation.
- Client accounts with distinct account number are treated separately. Client accounts are insured on a per account basis without aggregation

The inputs to this calculation, including account details and customer details are provided below.

Legal Entity	Account Number	Standard Product Type	Account Balance	Account Currency	Ownership Category	Primary Holder	Secondary Holder	Account Attribute	Unique Depositor Combination	Limit Applicable	Total Deposit per Unique Depositor	Insured Amount	Uninsured Amount
Legal Entity 1	100001	Saving Account	40,000	SGD	Single	Customer 001							
Legal Entity 1	100002	Current Account	36,903	SGD	Single	Customer 001				50,000	110,665	50,000	60,665
Legal Entity 1	100003	Term Deposit	33,762	SGD	Single	Customer 001			1				
Legal Entity 1	100004	Term Deposit	40,681	USD	Single	Customer 001				-	40,681	-	40,681
Legal Entity 1	100005	Saving Account	7,355	SGD	Single	Customer 002							
Legal Entity 1	100006	Term Deposit	44,995	SGD	Joint	Customer 002	Joint Account with Customer 003		2	50,000	29,852.50	29,852.50	-
Legal Entity 1	100007	Term Deposit	44,995	SGD	Joint	Customer 003	Joint Account with Customer 002		3	50,000	22,497.50	22,497.50	-
Legal	10000	Saving		SGD	Single	Customer			4				

Legal Entity	Account Number	Standard Product Type	Account Balance	Account Currency	Ownership Category	Primary Holder	Secondary Holder	Account Attribute	Unique Depositor Combination	Limit Applicable	Total Deposit per Unique Depositor	Insured Amount	Uninsured Amount
Entity 1	8	Account	7,568			004				50,000	44,773	44,773.00	-
Legal Entity 1	100009	Saving Account	37,205	SGD	Sole proprietorship	Customer 004							
Legal Entity 1	200100	Saving Account	29,451	SGD	Single	Customer 101			5	50,000	86,390	50,000	36,390
Legal Entity 1	200101	Current Account	79,640	SGD	Joint	Customer 101	Joint Account with Customer 102						
Legal Entity 1	200102	Term Deposit	10,700	SGD	Joint	Customer 101	Joint Account with Customer 103						
Legal Entity 1	200103	Term Deposit	11,769	SGD	Sole proprietorship	Customer 101							
Legal Entity 1	200103	Term Deposit	79,640	SGD	Joint	Customer 102	Joint Account with Customer 101		6	50,000	39,820	39,820.00	-

Legal Entity	Account Number	Standard Product Type	Account Balance	Account Currency	Ownership Category	Primary Holder	Secondary Holder	Account Attribute	Unique Depositor Combination	Limit Applicable	Total Deposit per Unique Depositor	Insured Amount	Uninsured Amount
Legal Entity 2	100010	Saving Account	7,337	SGD	Single	Customer 005			7	50,000	7,337	7,337.00	-
Legal Entity 3	100011	Term Deposit	45,016	SGD	Trust	Customer 005		For benefit of son	8	50,000	45,016	45,016.00	-
Legal Entity 4	100012	Term Deposit	6,574	SGD	Trust	Customer 005		For benefit of daughter	9	50,000	6,574	6,574.00	-
Legal Entity 5	100013	Saving Account	4,759	SGD	Trust	Customer 005		For benefit of spouse	10	50,000	4,759	4,759.00	-
Legal Entity 6	100014	Saving Account	20,517	SGD	Company	Customer 008		Office Account	11	50,000	20,517	20,517.00	-
Legal Entity 7	100015	Saving Account	24,254	SGD	Company	Customer 008		Client Account for Customer X	12	50,000	24,254	24,254.00	-
Legal Entity 8	100016	Saving Account	68,691	SGD	Company	Customer 008		Client Account for	13	50,000	68,691	50,000.00	18,691.00

Legal Entity	Account Number	Standard Product Type	Account Balance	Account Currency	Ownership Category	Primary Holder	Secondary Holder	Account Attribute	Unique Depositor Combination	Limit Applicable	Total Deposit per Unique Depositor	Insured Amount	Uninsured Amount
								Customer Y					
Legal Entity 9	100017	Saving Account	68,691	SGD	Single	Customer X			14	50,000	68,691	50,000.00	18,691.00
Legal Entity 1	100018	Deposit	50,101	SGD	CPFIS	Customer 501			15	50,000	50,101	50,000.00	101.00
Legal Entity 1	100019	Deposit	45,493	SGD	CPFRS	Customer 502			16	50,000	45,493	45,493.00	-
Legal Entity 1	100020	Deposit	14,252	SGD	CPFRS	Customer 503			17	50000	64,590	50000	14590
Legal Entity 1	100021	Deposit	50,338	SGD	CPFIS	Customer 503							
Legal Entity 1	100022	Deposit	58,412	SGD	Single	Customer 504			18	50,000	58,412	50,000.00	8,412.00
Legal Entity 1	100023	Deposit	10,700	SGD	CPFRS	Customer 504			19	50000	52,469	50000	2469

Legal Entity	Account Number	Standard Product Type	Account Balance	Account Currency	Ownership Category	Primary Holder	Secondary Holder	Account Attribute	Unique Depositor Combination	Limit Applicable	Total Deposit per Unique Depositor	Insured Amount	Uninsured Amount
Legal Entity 1	100024	Deposit	41,769	SGD	CPFIS	Customer 504							

2.2.6 Identification of Deposit Stability

Once the insurance limit is allocated at an account level, the application determines the deposit stability as follows:

1. Stable Deposits

   A stable deposit is that portion of a deposit which is fully covered by deposit insurance provided by an effective deposit insurance scheme or a public guarantee that provides equivalent protection and which satisfies one of the following conditions:

   a. It is held in a transactional account by the depositor

      Or,

   b. The depositor has an established relationship with the reporting legal entity.

   In case of MAS, if a deposit is partially covered by insurance and meets the other criteria, the insured portion of such deposits is considered stable while the uninsured portion is considered less stable.

   Stable deposits receive a 5% run-off rate unless they meet additional deposit criteria.

2. Highly Stable Deposits

   All "stable" deposits identified as per the criteria specified in point 1 above are classified as meeting additional insurance criteria if the insurance scheme under which they are covered satisfies the following conditions:

   i. Is based on a system of prefunding via the periodic collection of levies on banks with insured deposits.

   ii. Has adequate means of ensuring ready access to additional funding in the event of a large call on its reserves, for example, an explicit and legally binding guarantee from the government, or a standing authority to borrow from the government.

   iii. Access to insured deposits is available to depositors in a short period of time once the deposit insurance scheme is triggered.

   Such deposits receive a 3% run-off rate.

3. Less Stable Deposits

   All insured and uninsured deposit or funding balances that do not meet the stable deposits criteria specified earlier are classified as less stable deposits: This includes:

   - Insured balance of deposits meeting stable deposits criteria but denominated in ineligible foreign currencies.

- Uninsured balance of deposits meeting stable deposits criteria.
- Insured balance of deposits which are not transactional account and the customer has no established relationship with the bank.
- Deposit balance where the insurance coverage status is Uninsured.

Such deposits receive a 10% run-off rate.

2.2.7 Identification and Treatment of Pledged Deposits

A deposit is considered a pledged deposit when it is placed as a security against a loan(s) extended by the bank. It indicates that, when a customer receives a loan from a bank and contractually places the deposits held within the same bank as collateral, then the bank marks the respective deposits as pledged deposits.

For pledged deposits, the pledged portion of the deposit proceeds are paid out only when the loan against the deposit is repaid in full. Multiple deposits can be placed against multiple lien, such as loans, line of credit, guarantees and so on forming a many to many relationship.

The outflows for pledged deposits which will not mature within the LCR horizon may be excluded from the LCR calculation if the following conditions are met:

- The loan will not mature or settle in the next 30 days
- The pledge arrangement is subject to a legally enforceable contract disallowing withdrawal of the deposit before the loan is fully settled or repaid
- The amount of deposit to be excluded cannot exceed the outstanding balance of the loan

2.2.7.1 Identification of Pledged Deposits

Pledged deposits are identified in the staging area against deposits by a flag called lien marked indicator. The mapping between pledged deposits and the pledge against it is of many to many nature and is a download for the application.

2.2.7.2 Treatment of Pledged Deposits

When all the conditions mentioned in the guidelines are satisfied, the encumbered portion of pledged deposits is excluded and hence receives a 0% factor. The unencumbered portion of the pledged deposits is included and receives appropriate run off rate as applicable.

To cater to pledged deposits, the following based measures are used in the business assumptions.

- Unencumbered highly stable balance: This measure populates the portion of highly stable amount, which is unencumbered.
- Unencumbered stable balance: This measure populates the portion of stable amount, which is unencumbered.
- Unencumbered less stable balance: This measure populates the portion of less stable amount, which is unencumbered.
- Encumbered balance: This measure populates the encumbered amount of the deposit.

See Regulations Addressed through Business Assumptions for details of the pre seeded assumptions on pledged deposits.

2.2.8 Secured Funding

For Secured Accounts involving collateral placed or collateral received, there is an option to compute balances and cash flows in two granularities:

- Account level
- Account-collateral level

This option enables the treatment of partially secured accounts, and granular processing of an account with multiple collaterals. By default, secured funding computations happen at the account level for partially secured accounts. This can be changed to Account-collateral level by updating the value of the setup master table entry for SEC_TRANS_TREATMENT_PURPOSE_VAL to YES.

Account level:

By default, all computations are done at the Account Level. This means that if there are multiple collaterals securing an account, the collateral level information will be aggregated and processed at an account level.

Account-collateral level:

Collateral level measures, such as the ones at the HQLA Asset level, encumbrance period and so on, are computed at the collateral-account level. This means that if there are multiple collaterals securing an account, the collateral level information is processed at the same account- collateral level without aggregating any data.

2.2.9 Classification of Operational Deposits

Operational deposits are those deposits placed by customers with a bank or balances kept by the bank with other financial institutions in order to meet their payment and settlement needs and other operational requirements. The application classifies accounts as operational, if they meet the following criteria:

1. They are held in specifically designated accounts that is held as operational accounts, by the customers at the bank.
2. They are priced without giving economic incentive to the customer to leave excess funds in the account.
3. They arise out clearing, custody or cash management relationship with the bank.
4. They do not arise out of correspondent banking services or in the context of prime brokerage services.
5. The termination of such agreements requires a minimum notice period of 30 days.
6. If the agreement can be terminated within 30 days, the customer has to pay significant switching or termination costs to the bank.

1. Any excess balances held in an account classified as an operational deposit over and above that which is required to meet operational needs of the customer is assigned a higher outflow rate by the regulator. The application supports a methodology for computing the portion of the balance held for operational purposes which is truly required to meet operational needs of the customer. For details see Calculation of Operational Amount.

2.2.10 Calculation of Contractually Required Collateral

Contractually required collateral is the amount of collateral that is contractually due from one party to the other based on the current exposure and collateral position. This amount has to be paid to the party at the earliest and results in an outflow for the party owing the collateral and inflow to the party to whom the collateral is due. It can be of two types based on the direction of the exposure:

- Contractually Due Collateral
- Contractually Receivable Collateral

2.2.10.1 In Case of Derivatives

2.2.10.1.1 Calculation of Contractually Due Collateral

The application computes the value of collateral that a bank is required to post contractually to its derivative counterparty as per the below procedure:

1. If Secured Indicator = No, then the contractually due collateral is 0. Else,
2. If Secured Indicator = Yes and CSA Type = One way then the contractually due collateral is 0. Else,
3. If Secured Indicator = Yes, CSA Type = Two way and Gross Exposure is >= 0, then the contractually due collateral is 0. Else,
4. If Secured Indicator = Yes, CSA Type = Two way and Gross Exposure is <0, the application computes the contractually due collateral as follows:

$$\boldsymbol{Contractually\ Due\ Collateral} = \boldsymbol{Max}[\mathbf{0}, \{\boldsymbol{Abs}(\boldsymbol{Gross\ Exposure}) - \boldsymbol{Threshold} - \boldsymbol{Collateral\ Posted}\}]$$

Where,

Threshold: Unsecured exposure that a party to a netting agreement is willing to assume before making collateral calls.

5. If Secured Indicator = Yes , CSA Type = Two way and Gross Exposure is <0,then the application computes contractually due collateral for Non-Netted Derivatives as follows:

$$\boldsymbol{Contractually\ Due\ Collateral} = \boldsymbol{Max}[\mathbf{0}, \{\boldsymbol{Abs}(\boldsymbol{Matk\ To\ Market\ Value}) - \boldsymbol{Threshold} - \boldsymbol{Collateral\ Posted}\}]$$

The contractually due collateral is assumed to be posted and therefore receives the relevant outflow rate specified by the regulator as part of the pre-configured business assumptions for LCR calculations.

2.2.10.1.2 Calculation of Contractually Receivable Collateral

The application computes the value of collateral that a derivative counterparty is required to post contractually to the bank as per the below procedure:

1. If Secured Indicator = No, then the contractually receivable collateral is 0. Else,
2. If Secured Indicator = Yes and Gross Exposure is <= 0, then the contractually receivable collateral is 0. Else,

3. If Secured Indicator = Yes and Gross Exposure is >0, then the application computes the contractually receivable collateral as follows:

$$\boldsymbol{Contractually\ Receivable\ Collateral = Max[0, \{Abs(Gross\ Exposure) - Threshold - Collateral\ Received\}]}$$

The contractually receivable collateral does not receive a pre-specified inflow rate from the regulator and is, therefore, excluded from the LCR calculations. However, the application computes this for the purpose of reporting.

2.2.10.2 In case of Other Assets and Liabilities:

2.2.10.2.1 Calculation of Contractually Due Collateral

1. If Balance Sheet Category = Asset, then the contractually due collateral is 0. Else,
2. If Balance Sheet Category = Liability, and Secured Indicator = N, then the contractually due collateral is 0. Else,
3. If Balance Sheet Category = Liability, and Secured Indicator = Y, then the application computes the contractually due collateral as follows

$$\boldsymbol{Contractually\ Due\ Collateral = Max[0, \{EOP\ Balance\ of\ Liability - Collateral\ Posted\}]}$$

2.2.10.2.2 Calculation of Contractually Receivable Collateral

1. If Balance Sheet Category = Liability, then the contractually due collateral is 0. Else,
2. If Balance Sheet Category = Asset, and Secured Indicator = N, then the contractually due collateral is 0. Else,
3. If Balance Sheet Category = Asset, and Secured Indicator = Y then the application computes the contractually due collateral as follows

$$\boldsymbol{Contractually\ Receivable\ Collateral = Max[0, \{EOP\ Balance\ of\ Asset - Collateral\ Received\}]}$$

2.2.11 Calculation of Excess Collateral

Excess collateral is the value of collateral posted or received that is in excess of the collateral required based on the current levels of exposure and collateral position. This amount can be withdrawn by the party which has provided the collateral in excess of its exposure and results in an outflow to the party holding the excess collateral and an inflow to the party who has provided the excess collateral. It can be of two types:

- Excess Collateral Due
- Excess Collateral Receivable

2.2.11.1 In Case of Derivatives

2.2.11.1.1 Calculation of Excess Collateral Due

The application computes the value of collateral that a derivative counterparty has posted to the bank, in excess of the contractually required collateral, and therefore can be withdrawn by the counterparty, as per the below procedure:

1. If Secured Indicator = No, then the excess collateral due is 0. Else,
2. If Secured Indicator = Y and Gross Exposure is <=0, the application computes the excess collateral due as follows:

$$\boldsymbol{Excess\ Collateral\ Due = Min[Adjusted\ Collateral\ Received, Non - segregated\ Collateral\ Received]}$$

Where,

Adjusted collateral received:	Collateral received from the counterparty less customer withdrawable collateral
Customer withdrawable collateral:	Collateral received under re-hypothecation rights that can be contractually withdrawn by the customer within the LCR horizon without a significant penalty associated with such a withdrawal

3. If Secured Indicator = Y and Gross Exposure is >0, the application computes the excess collateral due as follows:

$$\boldsymbol{Excess\ Collateral\ Due = Min[Max\{0, Adjusted\ Collateral\ Received - Gross\ Exposure\}, Non - segregated\ Collateral\ Received]}$$

4. If Secured Indicator = Y and Gross Exposure is >0, then the application computes excess collateral due for Non-Netted Derivatives as follows:

$$\boldsymbol{Excess\ Collateral\ Due = Min[Max\{0, Adjusted\ Collateral\ Received - Matk\ To\ Market\ Value\}, Non - segregated\ Collateral\ Received]}$$

The excess collateral due is assumed to be recalled by the counterparty and therefore receives the relevant outflow rate specified by the regulator as part of the pre-configured business assumptions for LCR calculations.

2.2.11.1.2 Calculation of Excess Collateral Receivable

The application computes the value of collateral that the bank has posted to its derivative counterparty, in excess of the contractually required collateral, and therefore can be withdrawn by the bank, as per the below procedure:

1. If Secured Indicator = No, then the excess collateral receivable is 0. Else,
2. If Secured Indicator = Y and Gross Exposure is >=0, the application computes the excess collateral receivable as follows:

$$\boldsymbol{Excess\ Collateral\ Receivable} = \boldsymbol{Min}[\boldsymbol{Adjusted\ Collateral\ Posted}, \boldsymbol{Non - segregated\ Collateral\ Posted}]$$

Where,

Adjusted collateral posted: Collateral posted by the bank less firm withdrawable collateral

Firm withdrawable collateral: Collateral provided under re-hypothecation rights that can be contractually withdrawn by the bank within the LCR horizon without a significant penalty associated with such a withdrawal

3. If Secured Indicator = Y and Gross Exposure is <0, the application computes the excess collateral receivable as follows:

$$\boldsymbol{Excess\ Collateral\ Receivable} = \boldsymbol{Min}[\boldsymbol{Max}\{\boldsymbol{0}, \boldsymbol{Adjusted\ Collateral\ Posted} - \boldsymbol{Abs}(\boldsymbol{Gross\ Exposure})\}, \boldsymbol{Non - segregated\ Collateral\ Posted}]$$

The excess collateral receivable does not receive a pre-specified inflow rate from the regulator and is, therefore, excluded from the LCR calculations. However, the application computes this for the purpose of reporting.

2.2.11.2 In case of Other Assets and Liabilities

2.2.11.2.1 Calculation of Excess Collateral Due

1. If Balance Sheet Category = Liability, then the contractually due collateral is 0. Else,
2. If Balance Sheet Category = Asset, and Secured Indicator = N, then the contractually due collateral is 0. Else,
3. If Balance Sheet Category = Asset, and Secured Indicator = Y, then the application computes the contractually due collateral as follows

$$\boldsymbol{Excess\ Collateral\ Due} = \boldsymbol{Min}[\boldsymbol{Max}\{\boldsymbol{0}, \boldsymbol{Adjusted\ Collateral\ Received} - \boldsymbol{EOP\ Balance\ of\ Asset}\}, \boldsymbol{Non - segregated\ Collateral\ Received}]$$

2.2.11.2.2 Calculation of Excess Collateral Receivable

1. If Balance Sheet Category = Asset, then the contractually due collateral is 0. Else,
2. If Balance Sheet Category = Liability, and Secured Indicator = N, then the contractually due collateral is 0. Else,
3. If Balance Sheet Category = Liability, and Secured Indicator = Y, then the application computes the contractually due collateral as follows

$$\textit{\textbf{Excess Collateral Receivable}} = \textit{\textbf{Min}}[\textit{\textbf{Max}}\{\mathbf{0}, \textit{\textbf{Adjusted Collateral Posted}} - \textit{\textbf{EOP Balance of Liability}}\}, \textit{\textbf{Non}} - \textit{\textbf{segregated Collateral Posted}}]$$

2.2.12 Calculation of Downgrade Impact Amount

2.2.12.1 Calculation of Downgrade Impact Amount for Derivatives

The downgrade impact amount for derivatives is calculated as follows:

1. If a downgrade trigger does not exist for the derivatives contract or netting agreement, the downgrade impact amount is 0. Else,
2. If Net Exposure >0, the downgrade impact amount is 0. Else,
3. If Net Exposure <=0, the downgrade impact amount is calculated as follows:

$$\textit{\textbf{Downgrade Impact Amount}} = \textit{\textbf{Max}}[\mathbf{0}, \{\textit{\textbf{Abs}}(\textit{\textbf{Net Exposure}}) - \textit{\textbf{Contractually Due Collateral}}\}]$$

2.2.12.2 Calculation of Downgrade Impact Amount for Other Liabilities

In case of other liabilities, including annuities, that have an associated downgrade, the downgrade impact amount is calculated as follows:

1. If a downgrade trigger does not exist for the liability account, the downgrade impact amount is 0. Else,
2. The downgrade impact amount for liabilities other than derivatives and securitizations is calculated as follows:

$$\textit{\textbf{Downgrade Impact Amount}} = \textit{\textbf{Max}}[\mathbf{0}, (\textit{\textbf{EOP Balance}} - \textit{\textbf{Collateral Posted}})]$$

NOTE: Any liability account that is triggered due to a particular level of ratings downgrade has an outflow corresponding to a pre-specified percentage of the downgrade impact amount. For instance, if a 3-notch downgrade is specified, then the downgrade impact amount will outflow only for those accounts that have a trigger of 1-notch, 2-notches and 3-notches. If a 2-notch downgrade is specified, then the downgrade impact amount will outflow only for those accounts that have a trigger of 1-notch and 2-notches.The ratings downgrade and the outflow percentage as specified by the regulator are part of the pre-configured business assumptions for LCR calculations.

2.2.13 Calculation of Net Derivative Cash Inflows and Outflows

2.2.13.1 Cash Flow Netting at Derivative Contract Level

Cash flows from each derivative contract are netted when the derivatives contract are not settled through physical delivery, as follows:

1. If the cash inflows and outflows are denominated in the same currency and occur in the same time bucket:
   a. The cash inflows and outflows are summed up and the net value is computed as follows:

      $$Net\ Cash\ Flow = Cash\ Outflow - Cash\ Inflow$$

   b. If the net cash flow is positive and there is no netting agreement associated with the derivative contract, the value is treated as net derivative cash outflow.
   c. If the net cash flow is negative and there is no netting agreement associated with the derivative contract, the value is treated as net derivative cash inflow.
2. If the cash inflows and outflows are denominated in different currencies but settle within the same day:
   a. The cash inflows and outflows are summed up after being converted to the reporting currency and the net value is computed.
   b. If the net cash flow is positive and there is no netting agreement associated with the derivative contract, the value is treated as net derivative cash outflow.
   c. If the net cash flow is negative and there is no netting agreement associated with the derivative contract, the value is treated as net derivative cash inflow.
3. If the cash inflows and outflows are denominated in different currencies and do not settle within the same day:
   a. The cash outflows from each derivative contract without an associated netting agreement are summed up and treated as net derivative cash outflow.
   b. The cash inflows from each derivative contract without an associated netting agreement are summed up and treated as net derivative cash inflow.

NOTE: If a derivative contract has a netting agreement associated with it, the cash flow is further netted across contracts at the netting agreement level.

2.2.13.2 Cash Flow Netting at Netting Agreement Level

For derivative contracts which have a netting agreement associated with them, the net cash flows computed at the derivative contract level are further netted across multiple contracts under the same netting agreement as follows:

1. In case of derivative contracts, that belong to a single netting agreement, whose payment netting agreement flag is Yes:
    a. The cash inflows and outflows occurring in each time bucket, denominated in each currency, are summed up across all contracts whose payment netting agreement flag is Yes and the net value is computed.
    b. If the net cash flow is positive, the value is treated as net derivative cash outflow.
    c. If the net cash flow is negative, the value is treated as net derivative cash inflow.
2. In case of derivative contracts, that belong to a single netting agreement, whose payment netting agreement flag is No:
    a. The cash outflows occurring in each time bucket, denominated in each currency, are summed up separately for each derivative contract whose payment netting agreement flag is No and treated as net derivative cash outflow.
    b. The cash inflows occurring in each time bucket, denominated in each currency, are summed up separately for each derivative contract whose payment netting agreement flag is No and treated as net derivative cash inflow.

NOTE: Cash flow netting for netting agreements is done separately for each currency. Cash flows are not netted across currencies, instead, the inflows and outflows converted into the reporting currency are summed up separately to report the net derivatives cash inflow and net derivatives cash outflow at an entity level.

2.2.14 Calculation of Twenty Four Month Look-back Amount

The application computes the 24 month look-back amount, for the purpose of defining outflows due to increased liquidity needs related to market valuation changes on derivatives as per the procedure given below:

- The Mark-to-Market (MTM) value of collateral outflows and inflows due to valuation changes on derivative transactions are captured at a legal entity level. The values over a 24-month historical time window from the “as of date” are identified.
- The application computes the largest 30-day absolute net collateral flow occurring within each rolling 30-day historical time window as follows:

i. The net Mark-to-Market collateral change is computed for each day within a particular 30-day historical time window as follows:

$$\boldsymbol{Net\ MTM\ Collateral\ Change = MTM\ Colateral\ Outflows - MTM\ Collateral\ Inflows}$$

ii. The cumulative net Mark-to-Market collateral change is computed for each day within a particular 30-day historical time window as follows:

$$\boldsymbol{Cumulative\ Net\ MTM\ Collateral\ Change = \sum_{1}^{i} Net\ MTM\ Collateral\ Change}$$

Where,

i : Each day within a particular 30-day historical time window

n : Each 30-day historical time window

iii. The absolute net Mark-to-Market collateral change is computed for each day within the rolling 30-day historical time window as follows:

$$\boldsymbol{Absolute\ Net\ MTM\ Collateral\ Change = Abs(Cumulative\ Net\ MTM\ Collateral\ Change)}$$

iv. The largest 30-day absolute net collateral flow occurring within the rolling 30-day historical time window is identified as follows:

$$\boldsymbol{Largest\ 30 - day\ Absolute\ Net\ Collateral\ Flow = Max(Absolute\ Net\ MTM\ Collateral\ Change_i)}$$

Note: Steps (i) to (iv) are repeated for each rolling 30-day historical time window.

- The 24-month look-back amount is calculated as follows:

$$\mathbf{24 - \mathit{Month\ Lookback\ Amount} = \mathit{Max}(\mathit{Largest}\ 30 - \mathit{day\ Absolute\ Net\ Collateral\ Flow}_{n})}$$

Note:

4. This calculation is done for each legal entity separately.
5. The largest 30-day absolute net collateral flow is computed in 30 day blocks on a rolling basis that is first 30-day block is As of Date to As of Date - 29; second 30-day block is As of Date - 1 to As of Date - 30 and so on.
6. The 24 month look-back amount is computed as the maximum of the largest absolute net collateral flow during all rolling 30-day periods in each 24 month period.

The 24-month look-back calculations are illustrated below considering a 34-day historical time window instead of 24-months. This results in 5 rolling 30-day windows.

Rolling 30-Day Period	Day	Mark-To-Market Collateral Outflows Due To Derivative Transaction Valuation Changes (a)	Mark-To-Market Collateral Inflows Due To Derivative Transaction Valuation Changes (b)	Net Mark-To-Market Collateral Change (c = a – b)	Cumulative Net Mark-To-Market Collateral Change (d = Cumulative c)	Absolute Net Mark-To-Market Collateral Change [e = Abs (d)]
As of Date to As of Date - 29	As of Date	65	14	51	51	51
	As of Date - 1	65	9	56	107	107
	As of Date - 2	74	83	-9	98	98
	As of Date - 3	71	97	-26	72	72
	As of Date - 4	84	89	-5	67	67
	As of Date - 5	8	57	-49	18	18
	As of Date - 6	40	59	-19	-1	1
	As of Date - 7	42	87	-45	-46	46

Rolling 30-Day Period	Day	Mark-To-Market Collateral Outflows Due To Derivative Transaction Valuation Changes (a)	Mark-To-Market Collateral Inflows Due To Derivative Transaction Valuation Changes (b)	Net Mark-To-Market Collateral Change (c = a – b)	Cumulative Net Mark-To-Market Collateral Change (d = Cumulative c)	Absolute Net Mark-To-Market Collateral Change [e = Abs (d)]
	As of Date - 8	100	6	94	48	48
	As of Date - 9	41	30	11	59	59
	As of Date - 10	45	9	36	95	95
	As of Date - 11	9	32	-23	72	72
	As of Date - 12	59	67	-8	64	64
	As of Date - 13	61	10	51	115	115
	As of Date - 14	22	36	-14	101	101
	As of Date - 15	63	81	-18	83	83
	As of Date - 16	36	3	33	116	116
	As of Date - 17	61	22	39	155	155
	As of Date - 18	94	37	57	212	212
	As of Date - 19	3	18	-15	197	197
	As of Date - 20	13	27	-14	183	183
	As of Date - 21	24	56	-32	151	151
	As of Date - 22	57	75	-18	133	133

Rolling 30-Day Period	Day	Mark-To-Market Collateral Outflows Due To Derivative Transaction Valuation Changes (a)	Mark-To-Market Collateral Inflows Due To Derivative Transaction Valuation Changes (b)	Net Mark-To-Market Collateral Change (c = a – b)	Cumulative Net Mark-To-Market Collateral Change (d = Cumulative c)	Absolute Net Mark-To-Market Collateral Change [e = Abs (d)]
	As of Date - 23	66	87	-21	112	112
	As of Date - 24	33	71	-38	74	74
	As of Date - 25	29	30	-1	73	73
	As of Date - 26	64	25	39	112	112
	As of Date - 27	54	39	15	127	127
	As of Date - 28	51	6	45	172	172
	As of Date - 29	35	31	4	176	176
As of Date - 1 to As of Date - 30	As of Date - 1	65	9	56	56	56
	As of Date - 2	74	83	-9	47	47
	As of Date - 3	71	97	-26	21	21
	As of Date - 4	84	89	-5	16	16
	As of Date - 5	8	57	-49	-33	33
	As of Date - 6	40	59	-19	-52	52
	As of Date - 7	42	87	-45	-97	97
	As of Date - 8	100	6	94	-3	3

Rolling 30-Day Period	Day	Mark-To-Market Collateral Outflows Due To Derivative Transaction Valuation Changes (a)	Mark-To-Market Collateral Inflows Due To Derivative Transaction Valuation Changes (b)	Net Mark-To-Market Collateral Change (c = a – b)	Cumulative Net Mark-To-Market Collateral Change (d = Cumulative c)	Absolute Net Mark-To-Market Collateral Change [e = Abs (d)]
	As of Date - 9	41	30	11	8	8
	As of Date - 10	45	9	36	44	44
	As of Date - 11	9	32	-23	21	21
	As of Date - 12	59	67	-8	13	13
	As of Date - 13	61	10	51	64	64
	As of Date - 14	22	36	-14	50	50
	As of Date - 15	63	81	-18	32	32
	As of Date - 16	36	3	33	65	65
	As of Date - 17	61	22	39	104	104
	As of Date - 18	94	37	57	161	161
	As of Date - 19	3	18	-15	146	146
	As of Date - 20	13	27	-14	132	132
	As of Date - 21	24	56	-32	100	100
	As of Date - 22	57	75	-18	82	82
	As of Date - 23	66	87	-21	61	61

Rolling 30-Day Period	Day	Mark-To-Market Collateral Outflows Due To Derivative Transaction Valuation Changes (a)	Mark-To-Market Collateral Inflows Due To Derivative Transaction Valuation Changes (b)	Net Mark-To-Market Collateral Change (c = a – b)	Cumulative Net Mark-To-Market Collateral Change (d = Cumulative c)	Absolute Net Mark-To-Market Collateral Change [e = Abs (d)]
	As of Date - 24	33	71	-38	23	23
	As of Date - 25	29	30	-1	22	22
	As of Date - 26	64	25	39	61	61
	As of Date - 27	54	39	15	76	76
	As of Date - 28	51	6	45	121	121
	As of Date - 29	35	31	4	125	125
	As of Date - 30	93	68	25	150	150
As of Date - 2 to As of Date - 31	As of Date - 2	74	83	-9	-9	9
	As of Date - 3	71	97	-26	-35	35
	As of Date - 4	84	89	-5	-40	40
	As of Date - 5	8	57	-49	-89	89
	As of Date - 6	40	59	-19	-108	108
	As of Date - 7	42	87	-45	-153	153
	As of Date - 8	100	6	94	-59	59
	As of Date - 9	41	30	11	-48	48

Rolling 30-Day Period	Day	Mark-To-Market Collateral Outflows Due To Derivative Transaction Valuation Changes (a)	Mark-To-Market Collateral Inflows Due To Derivative Transaction Valuation Changes (b)	Net Mark-To-Market Collateral Change (c = a – b)	Cumulative Net Mark-To-Market Collateral Change (d = Cumulative c)	Absolute Net Mark-To-Market Collateral Change [e = Abs (d)]
	As of Date - 10	45	9	36	-12	12
	As of Date - 11	9	32	-23	-35	35
	As of Date - 12	59	67	-8	-43	43
	As of Date - 13	61	10	51	8	8
	As of Date - 14	22	36	-14	-6	6
	As of Date - 15	63	81	-18	-24	24
	As of Date - 16	36	3	33	9	9
	As of Date - 17	61	22	39	48	48
	As of Date - 18	94	37	57	105	105
	As of Date - 19	3	18	-15	90	90
	As of Date - 20	13	27	-14	76	76
	As of Date - 21	24	56	-32	44	44
	As of Date - 22	57	75	-18	26	26
	As of Date - 23	66	87	-21	5	5
	As of Date - 24	33	71	-38	-33	33

Rolling 30-Day Period	Day	Mark-To-Market Collateral Outflows Due To Derivative Transaction Valuation Changes (a)	Mark-To-Market Collateral Inflows Due To Derivative Transaction Valuation Changes (b)	Net Mark-To-Market Collateral Change (c = a – b)	Cumulative Net Mark-To-Market Collateral Change (d = Cumulative c)	Absolute Net Mark-To-Market Collateral Change [e = Abs (d)]
	As of Date - 25	29	30	-1	-34	34
	As of Date - 26	64	25	39	5	5
	As of Date - 27	54	39	15	20	20
	As of Date - 28	51	6	45	65	65
	As of Date - 29	35	31	4	69	69
	As of Date - 30	93	68	25	94	94
	As of Date - 31	51	97	-46	48	48
As of Date - 3 to As of Date - 32	As of Date - 3	71	97	-26	-26	26
	As of Date - 4	84	89	-5	-31	31
	As of Date - 5	8	57	-49	-80	80
	As of Date - 6	40	59	-19	-99	99
	As of Date - 7	42	87	-45	-144	144
	As of Date - 8	100	6	94	-50	50
	As of Date - 9	41	30	11	-39	39
	As of Date - 10	45	9	36	-3	3

Rolling 30-Day Period	Day	Mark-To-Market Collateral Outflows Due To Derivative Transaction Valuation Changes (a)	Mark-To-Market Collateral Inflows Due To Derivative Transaction Valuation Changes (b)	Net Mark-To-Market Collateral Change (c = a – b)	Cumulative Net Mark-To-Market Collateral Change (d = Cumulative c)	Absolute Net Mark-To-Market Collateral Change [e = Abs (d)]
	As of Date - 11	9	32	-23	-26	26
	As of Date - 12	59	67	-8	-34	34
	As of Date - 13	61	10	51	17	17
	As of Date - 14	22	36	-14	3	3
	As of Date - 15	63	81	-18	-15	15
	As of Date - 16	36	3	33	18	18
	As of Date - 17	61	22	39	57	57
	As of Date - 18	94	37	57	114	114
	As of Date - 19	3	18	-15	99	99
	As of Date - 20	13	27	-14	85	85
	As of Date - 21	24	56	-32	53	53
	As of Date - 22	57	75	-18	35	35
	As of Date - 23	66	87	-21	14	14
	As of Date - 24	33	71	-38	-24	24
	As of Date - 25	29	30	-1	-25	25

Rolling 30-Day Period	Day	Mark-To-Market Collateral Outflows Due To Derivative Transaction Valuation Changes (a)	Mark-To-Market Collateral Inflows Due To Derivative Transaction Valuation Changes (b)	Net Mark-To-Market Collateral Change (c = a – b)	Cumulative Net Mark-To-Market Collateral Change (d = Cumulative c)	Absolute Net Mark-To-Market Collateral Change [e = Abs (d)]
	As of Date - 26	64	25	39	14	14
	As of Date - 27	54	39	15	29	29
	As of Date - 28	51	6	45	74	74
	As of Date - 29	35	31	4	78	78
	As of Date - 30	93	68	25	103	103
	As of Date - 31	51	97	-46	57	57
	As of Date - 32	12	31	-19	38	38
As of Date - 4 to As of Date - 33	As of Date - 4	84	89	-5	-5	5
	As of Date - 5	8	57	-49	-54	54
	As of Date - 6	40	59	-19	-73	73
	As of Date - 7	42	87	-45	-118	118
	As of Date - 8	100	6	94	-24	24
	As of Date - 9	41	30	11	-13	13
	As of Date - 10	45	9	36	23	23
	As of Date - 11	9	32	-23	0	0

Rolling 30-Day Period	Day	Mark-To-Market Collateral Outflows Due To Derivative Transaction Valuation Changes (a)	Mark-To-Market Collateral Inflows Due To Derivative Transaction Valuation Changes (b)	Net Mark-To-Market Collateral Change (c = a – b)	Cumulative Net Mark-To-Market Collateral Change (d = Cumulative c)	Absolute Net Mark-To-Market Collateral Change [e = Abs (d)]
	As of Date - 12	59	67	-8	-8	8
	As of Date - 13	61	10	51	43	43
	As of Date - 14	22	36	-14	29	29
	As of Date - 15	63	81	-18	11	11
	As of Date - 16	36	3	33	44	44
	As of Date - 17	61	22	39	83	83
	As of Date - 18	94	37	57	140	140
	As of Date - 19	3	18	-15	125	125
	As of Date - 20	13	27	-14	111	111
	As of Date - 21	24	56	-32	79	79
	As of Date - 22	57	75	-18	61	61
	As of Date - 23	66	87	-21	40	40
	As of Date - 24	33	71	-38	2	2
	As of Date - 25	29	30	-1	1	1
	As of Date - 26	64	25	39	40	40

Rolling 30-Day Period	Day	Mark-To-Market Collateral Outflows Due To Derivative Transaction Valuation Changes (a)	Mark-To-Market Collateral Inflows Due To Derivative Transaction Valuation Changes (b)	Net Mark-To-Market Collateral Change (c = a – b)	Cumulative Net Mark-To-Market Collateral Change (d = Cumulative c)	Absolute Net Mark-To-Market Collateral Change [e = Abs (d)]
	As of Date - 27	54	39	15	55	55
	As of Date - 28	51	6	45	100	100
	As of Date - 29	35	31	4	104	104
	As of Date - 30	93	68	25	129	129
	As of Date - 31	51	97	-46	83	83
	As of Date - 32	12	31	-19	64	64
	As of Date - 33	34	36	-2	62	62

The largest 30-day absolute net collateral flow for each rolling 30-day period and the 24 month look-back value (in this example, the 34 day look-back value) are computed as follows:

Rolling 30-Day Period	Largest 30-Day Absolute Net Collateral Flow [f = Max (e)]	24 Month Look-back Value [Max (f)]
As of Date to As of Date - 29	212	212
As of Date - 1 to As of Date - 30	161	
As of Date - 2 to As of Date - 31	153	

Rolling 30-Day Period	Largest 30-Day Absolute Net Collateral Flow [f = Max (e)]	24 Month Look-back Value [Max (f)]
As of Date - 3 to As of Date - 32	144	
As of Date - 4 to As of Date - 33	140	

2.2.15 Calculation of Operational Amount

The regulator prescribed lower outflow rate for operational deposits is to be applied only to that portion of the EOP balance that is truly held to meet operational needs. The application supports a new methodology to compute the operational portion of the EOP balance of operational deposits. The steps involved in computing the operational balance are as follows:

1. All deposits classified as operational as per regulatory guidelines are identified. This is a separate process in LRM.
2. The EOP balances of eligible operational accounts are obtained over a 90-day historical window including the As of Date i.e. As of Date – 89 days. To identify historical observations, the f_reporting_flag has to be updated as 'Y' for one execution of the Run per day in the LRM Run Management Execution Summary UI. The application looks up the balance for such accounts against the Run execution for which the Reporting Flag is updated as "Y" for each day in the past.

   Note:

   The historical time window is captured as a parameter in the SETUP_MASTER table. The default value is 90 days which can be modified by the user. To modify this value, you can update the value under the component code DAYS_HIST_OPER_BAL_CALC_UPD
3. A rolling 5 day average is calculated for each account over the historical window.
4. The average of the 5-day rolling averages computed in step 3 is calculated.
5. The operational balance is calculated as follows:

   Note:

The calculation of the operational balance can be either a direct download from the staging tables, or through the historical balance approach.

$$\boldsymbol{Operational\ Balance = Min\ (Current\ EOP\ Balance, Average\ Computed\ in\ Step\ 4)}$$

Note:

i. The operational balance calculation based on historical lookback is optional. You can choose to compute the operational balances using this method or provide the value as a download. To provide the value as download, update the value in the SETUP_MASTER table under the component code HIST_OPERATIONAL_BAL_CALC_UPD as N . If the value is 'Y' then the value would be calculated through historical balance approach.

6. The non-operational balance is calculated as follows:

$$\boldsymbol{Non-operational\ Balance = Current\ EOP\ Balance - Operational\ Balance}$$

7. The operational insured balance is calculated as follows:

$$\boldsymbol{Operational\ Insured\ Balance = Min\ (Operational\ Balance, Insured\ Balance)}$$

The insured and uninsured balances are calculated as part of a separate process i.e. the insurance allocation process which is explained in detail in the relevant section under each jurisdiction.

8. The operational uninsured balance is calculated as follows:

$$\boldsymbol{Operational\ Uninsured\ Balance = Operational\ Balance - Insured\ Operational\ Balance}$$

9. The non-operational insured balance is calculated as follows:

$$\boldsymbol{Non-operational\ Insured\ Balance = Min\ [Non-operational\ Balance, (Insured\ Balance - Insured\ Operational\ Balance)]}$$

10. The non-operational uninsured balance is calculated as follows:

$$\boldsymbol{Non-operational\ Uninsured\ Balance = Non-operational\ Balance - Insured\ Non-operational\ Balance}$$

The operational deposit computation process is illustrated below assuming a 15-day historical window instead of 90-days and for the "as of date" 28th February 2017. The historical balances for 15-days including the "as of date" are provided below.

Clients With Operational Accounts	Eligible Operational Accounts	Historical Time Window														As of Date
		2/14/2017	2/15/2017	2/16/2017	2/17/2017	2/18/2017	2/19/2017	2/20/2017	2/21/2017	2/22/2017	2/23/2017	2/24/2017	2/25/2017	2/26/2017	2/27/2017	2/28/2017
A	10001	102,000	102,125	102,250	102,375	102,500	102,625	102,750	102,875	103,000	103,125	103,250	103,375	103,500	103,625	103,750
	10296	23,500	23,550	23,600	23,650	23,700	23,750	23,800	23,850	23,900	23,950	24,000	24,050	24,100	24,150	24,200
B	31652	65,877	59,259	59,234	59,209	59,184	59,159	59,134	59,109	59,084	59,059	59,034	59,009	58,984	58,959	58,934

The rolling averages and cumulative average are computed as follows:

Clients with Operational Accounts	Eligible Operational Accounts	5-day Rolling Average											Cumulative Average (a)
		2/18/2017	2/19/2017	2/20/2017	2/21/2017	2/22/2017	2/23/2017	2/24/2017	2/25/2017	2/26/2017	2/27/2017	2/28/2017	
A	10001	102,250	102,375	102,500	102,625	102,750	102,875	103,000	103,125	103,250	103,375	103,500	95136
	10296	23,600	23,650	23,700	23,750	23,800	23,850	23,900	23,950	24,000	24,050	24,100	22721
B	31652	60,553	59,209	59,184	59,159	59,134	59,109	59,084	59,059	59,034	59,009	58,984	56931

The operational and non-operational balances are computed as follows:

Clients with Operational Accounts	Eligible Operational Accounts	Current Balance (b)	Operational Balance (c = a – b)	Non-Operational Balance	Insured Balance	Uninsured Balance	Insured Operational Balance	Uninsured Operational Balance	Insured Non-Operational Balance	Uninsured Non-Operational Balance
A	10001	103,750	95,136	8,615	100,000	3,750	95,136		4,865	3,750
	10296	24,200	22,721	1,480		24,200		22,721		1,480
B	31652	58,934	56,931	2,003	58,934		56,931		2,003	

Note:

1. Negative historical balances are replaced by zero for the purposes of this computation.
2. For operational accounts that have an account start date >= historical days including the “as of date”, missing balances are replaced by previous available balance.
3. For operational accounts that have an account start date < historical days including the “as of date”:
    i. Missing balances between account start date and “as of date” are replaced by previous available balance.
    ii. Rolling average is calculated only for the period from account start date to the “as of date”.
4. The option to provide the operational balance as a download is supported by the application.

2.2.16 Calculation of HQLA Transferability Restriction

Regulators across jurisdictions recognize the existence of liquidity transfer restrictions, for banks that operate in multiple jurisdictions. Such transfer restrictions have implications to the group-wide consolidated LCR calculations and hence require to be treated appropriately. OFS LRM, in the LCR consolidation process, includes the restricted HQLA from a subsidiary in the consolidated stock of HQLA only to the extent of that subsidiary's liquidity needs i.e. its net cash outflow, in accordance with the regulatory requirements. The treatment of transferability restriction during consolidation is as follows:

1. The net cash outflows are computed for a subsidiary, on a consolidated basis. The consolidation entity is the subsidiary itself in this case. If the subsidiary is a leaf level entity, then the net cash outflow is calculated on a standalone basis.
2. The restricted and unrestricted stock of level 1, level 2A and level 2B is computed for the subsidiary on a consolidated basis. OFS LRM captures the HQLA transferability restriction at an account level through the flag F_TRANSFERABILITY_RESTRICTION.
3. The application checks whether the stock of restricted level 1 assets > net cash outflows. If yes, it includes the stock of restricted level 1 assets in the calculation of its immediate parent entity's stock of HQLA up to the extent of its own net cash outflows computed as part of step 1. If no, the entire stock of restricted level 1 assets is included in the consolidated calculations.
4. The application checks whether the stock of restricted level 1 + level 2A assets > net cash outflows. If yes, it includes the stock of restricted level 2A assets in the calculation of its immediate parent entity's stock of HQLA up to the extent of its own net cash outflows computed as part of step 1 less stock of restricted level 1 assets. If no, the entire stock of restricted level 2A assets is included in the consolidated calculations.
5. The application checks whether the stock of restricted level 1 + level 2A + level 2B assets > net cash outflows. If yes, it includes the stock of restricted level 2B assets in the calculation of its immediate parent entity's stock of HQLA up to the extent of its own net cash outflows computed as part of step 1 less stock of restricted level 1 + level 2A assets. If no, the entire stock of restricted level 2B assets is included in the consolidated calculations.
6. The unrestricted level 1, 2A and 2B assets are included fully in the calculation of its immediate parent entity's stock of HQLA.
7. Steps 1 to 6 are repeated for each sub-consolidation level within the organization structure of the consolidation entity till the consolidation entity itself.

Note:

- The allocation of restricted assets is done in the descending order of asset quality in order to maximize the stock of HQLA.
- This calculation is part of the LCR consolidation process. To get a complete view of the process, refer to the section of the user guide that describes the consolidation process for each jurisdiction.

2.2.17 Calculation of Net Cash Outflows

1. **Calculation of Total Cash Inflows**

   The application applies the business assumptions, specified on products involving cash inflows, selected as part of the Run. The regulatory assumptions specified in the section named Regulation Addressed through Business Assumptions are pre-defined and packaged as part of the out-of-the-box Run to determine the inflows over the liquidity horizon. The business assumption adjusted cash inflows occurring over the liquidity horizon are summed up to obtain the total cash inflow. These include inflows from earning assets such as loans, assets that are not eligible for inclusion in the stock of HQLA, derivatives inflows etc.

2. **Calculation of Total Cash Outflows**

   The application applies the business assumptions, specified on products involving cash outflows, selected as part of the Run. The regulatory assumptions specified in the section named Regulation Addressed through Business Assumptions are pre-defined and packaged as part of the out-of-the-box Run to determine the outflows over the liquidity horizon. The business assumption adjusted cash outflows occurring over the liquidity horizon are summed up to obtain the total cash outflow. These include outflows from liabilities, derivatives outflows, outflows due to changes in financial conditions such as ratings downgrade and valuation changes and so on.

3. **Calculation of Net Cash Outflow**

   Net cash outflow is computed as follows:

$$\begin{aligned} \textit{Net Cash Outflows}_{\textit{LCR Horizon}} &= \textit{Total Cash Outflows}_{\textit{LCR Horizon}} \\ &- \textit{Minimum}\{\textit{Total Cash Inflows}_{\textit{LCR Horizon}}, (75\% \times \textit{Total Cash Outflows}_{\textit{LCR Horizon}})\end{aligned}$$

2.2.18 Consolidation

The approach to consolidation as per LCR approach followed by OFS LRRCMAS is detailed below:

a. **Identification and Treatment of Unconsolidated Subsidiary**

The application assess whether a subsidiary is to be consolidated or not by checking the regulatory consolidated flag F_REGULATORY_ENTITY_IND against each legal entity. The application consolidates the cash inflows and outflows of a subsidiary and computes the consolidated LCR, only if the subsidiary is a regulatory consolidated subsidiary. If the entity is an unconsolidated subsidiary, the cash inflows and outflows from the operations of such subsidiaries are ignored (unless otherwise specifically included in the denominator of LCR per regulations) and only the equity investment in such subsidiaries is considered as the bank's asset and appropriately taken into the numerator or denominator based on the asset level classification.

For instance, legal entity 1 has 3 subsidiaries, legal entity 2, legal entity 3 and legal entity 4. The regulatory consolidated flag F_REGULATORY_ENTITY_IND for legal entity 4 is 'No'. In such a case, legal entity 4 is treated as a third party for the purpose of consolidation and its assets and cash flows are completely excluded from calculations. Legal entity 1's interest in legal entity 4 including common equity of legal entity 4 and assets and liabilities where legal entity 4 is the counterparty will not be eliminated as legal entity 4 is considered a third party during consolidation.

b. **HQLA Consolidation by Subsidiary Type**

The process of consolidating HQLA differs slightly based on whether the subsidiary is a material entity that is expected to report LCR separately from the parent or not. This is done to ensure consistency in the results when consolidating at a parent level and when calculating the LCR at the material subsidiary level as well. The methods followed for consolidating HQLA are:

i. In case of a material subsidiaries subject to individual LCR requirements, consolidation is done as follows:

- The application identifies whether the subsidiary is a consolidated subsidiary.
- If condition (a) is fulfilled, it identifies whether the consolidated subsidiary is subject to LCR requirement that is, whether the subsidiary in question is a regulated entity.
- If condition (b) is fulfilled, then it calculates the net cash outflow by eliminating all the inter-branch transactions at each country level of the consolidated subsidiary. If the consolidated subsidiary has operations in three countries, then the transaction between all the branches lying in the same country are eliminated. The application consolidates post-haircut restricted HQLA to the extent of the consolidated subsidiary's net cash outflow that is, to the extent required to satisfy minimum LCR requirements of that subsidiary as part of the covered company's HQLA. Restricted HQLA are the assets that have a restriction on their transferability to the parent entity, or are the assets that are denominated in non-convertible currencies.
- It consolidates the entire amount of post-haircut unrestricted HQLA held at the consolidated subsidiary as part of the covered company's HQLA.
- It consolidates all cash inflows and outflows which are part of the net cash flow calculation.

ii. In case of subsidiaries not subject to individual LCR requirements, consolidation is done as follows:

- The application identifies whether the subsidiary is a consolidated subsidiary.

- If condition (a) is fulfilled, it identifies whether the consolidated subsidiary is subject to minimum LCR requirement that is, whether the subsidiary in question is a regulated entity.
- If condition (b) is not fulfilled, it eliminates all inter-company transactions till the level of the immediate parent of the consolidated subsidiary and then calculates the net cash outflow.
- The application consolidates post-haircut restricted HQLA to the extent of the consolidated subsidiary's net cash outflow and the entire amount of post-haircut unrestricted HQLA as part of the covered company's HQLA.
- It consolidates all cash inflows and outflows which are part of the net cash flow calculation.

c. **Consolidated LCR Calculation**

Consolidation is done on a step by step basis based on each level of the organization structure starting from the most granular level. This indicates that intercompany transactions are eliminated at each sub-consolidation level till the final level of the consolidation (generally BHC) is reached. The consolidated HQLA calculated at the level of the immediate subsidiary of the BHC is added to the HQLA held by the BHC. All intercompany cash flows are eliminated and the LCR is calculated in accordance with the LCR approach.

For instance a bank's organization structure is as follows:

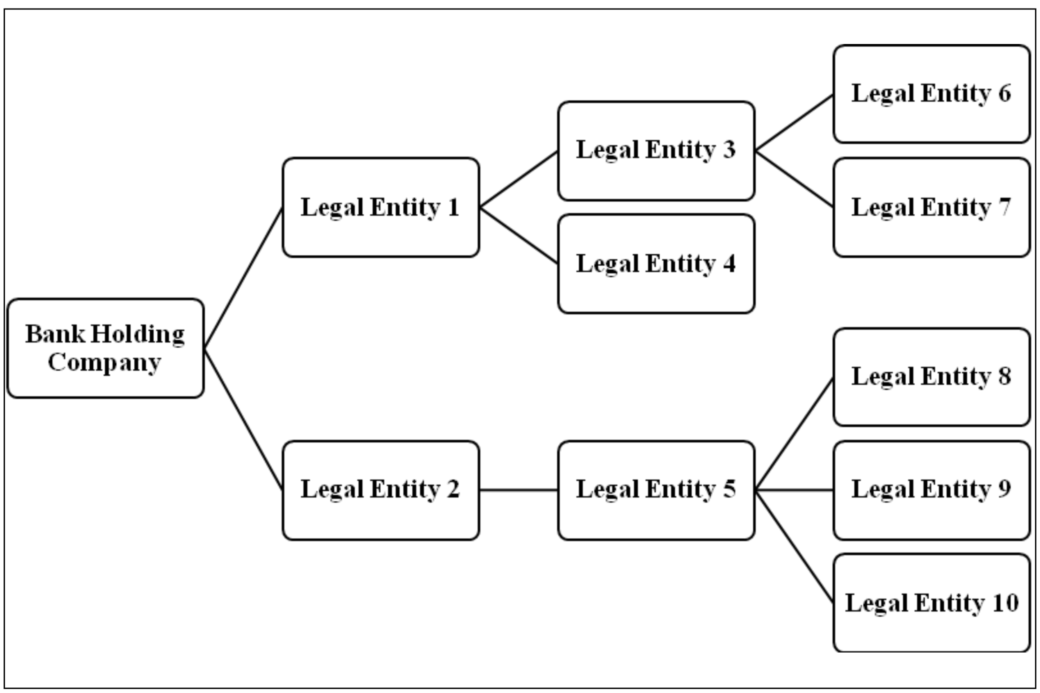

Figure 1 Organization Structure

In this case, at the first level of consolidation, calculation of net cash outflows and HQLA is done on a solo basis for legal entities 6, 7, 8, 9 and 10 as they do not have any subsidiaries. In case of regulated entities i.e. material entities, intercompany transactions are not eliminated; whereas in case of non-regulated entities, intercompany transactions are eliminated to the next level of consolidation that is, legal entities 3 and 5. The restricted HQLA from entities 6 and 7 are consolidated to the extent of their net cash outflows, while the unrestricted HQLA is transferred fully to legal entity 3. The cash inflows and outflows are consolidated to the full extent.

At the second level of consolidation that is, legal entity 3, intercompany transactions are eliminated till legal entity 1, if LE 3 is a non-regulated entity. The HQLA is calculated as a sum of the consolidated restricted and unrestricted HQLA of entities 6 and 7 and the HQLA of legal entity 3. The net cash outflow is calculated based on the cash flows of entities 3, 6 and 7, post elimination of intercompany transactions if applicable. The consolidated HQLA is calculated based on the procedure detailed in point 2 above.

This process continues in a step-by-step manner till the highest parent level i.e. the bank holding company in this example.

2.2.19 Calculation of Liquidity Coverage Ratio

Liquidity coverage ratio is calculated at legal entity on both solo and consolidated basis. The formula for calculating liquidity coverage ratio is as follows:

$$\boldsymbol{Liquidity\ Coverage\ Ratio} = \frac{\boldsymbol{Stock\ of\ High\ Quality\ Liquid\ Asset}}{\boldsymbol{Net\ Cash\ Outflow}}$$

2.2.20 Significant Currency Liquidity Coverage Ratio Calculation

Liquidity coverage ratio is also calculated for each legal entity at the level of each significant currency in order to identify potential currency mismatches. This is done by first identifying significant currencies for a legal entity, at a solo or consolidated level as specified in the Run, as follows:

$$\boldsymbol{Significant\ Currency} = \left[\frac{\boldsymbol{Total\ Liabilities}_{\boldsymbol{Legal\ Entity,Currency}}}{\boldsymbol{Total\ Liabilities}_{\boldsymbol{Legal\ Entity}}} \times \mathbf{100}\right] > 5\%$$

The application further computes and reports the stock of HQLA, net cash outflows and LCR for each currency identified as significant in the manner detailed in the earlier sections. This calculation is done on both solo and consolidated basis.

2.3 Pre-configured Regulatory LCR Scenario as per MAS

OFS LRRCMAS supports an out-of-the-box MAS LCR which has the regulatory scenario with associated HQLA haircuts, inflow and outflow percentage/ rates pre-configured in the form of business assumptions. This section explains the business assumptions along with the corresponding regulatory reference.

NOTE:

This section provides only the contextual information about all the business assumptions. For more detailed information refer OFS LRS application (UI).

For detailed Processes and Tasks, refer the Run Chart.

The below table lists the Document Identifiers provided in the column Regulatory Reference of Regulation Addressed through Business Assumptions and Regulations Addressed through Business Rules.

Regulation Reference	Document Number	Document Name	Issued Date
MC	MAS Notice 649	MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio	28 Nov 14
	SDIC	SDIC	24 Aug 18

The list of pre-configured business Rules and assumptions as well as the corresponding reference to the regulatory requirement that it addresses is provided in the tables listed in sections Regulations Addressed through Business Assumptions and Regulations Addressed through Business Rules.

2.3.1 Regulation Addressed through Business Rules

The application supports multiple pre-configured rules and scenarios based on MAS specified scenario parameters such as inflow rates, outflow rates, run-offs, haircuts and so on.

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
1	LRM - MAS - HQLA Level 1 - Cash , Central Bank Reserves and Sukuk	This rule reclassifies cash, central bank reserves and undrawn portion of committed facilities that foreign bank branches have received from its head office, reserves and sukuk issued by Singapore Sukuk Pte Ltd as HQLA Level 1 assets in accordance with the criteria specified by MAS	The classification of cash, central bank reserves and sukuk issued by Singapore Sukuk Pte Ltd. as HQLA level 1 asset is configured as part of this rule. Additionally, it classifies the undrawn portion of committed facilities that foreign bank branches have received from its head office as HQLA level 1 asset.	Paragraph 21 (a) Paragraph 21 (b) Paragraph 21 (c)
2	LRM - MAS - HQLA Level 1 - Sovereign, Central Bank and MDB Issued Zero Risk Weight Securities	This rule reclassifies marketable zero risk weight securities, issued by sovereigns, central banks, public sector enterprises, regional governments , municipalities , state agencies , state enterprises , Bank for International Settlements , International Monetary Fund , European Central Bank , European Community and Multilateral Development Banks as HQLA Level 1 assets, in accordance with the criteria specified by MAS.	The classification of marketable zero risk weight securities, issued by sovereigns, central banks, public sector enterprises, regional governments, municipalities, state agencies, state enterprises, Bank for International Settlements, International Monetary Fund, European Central Bank, European Community and Multilateral Development Banks as HQLA Level 1 assets is configured as part of this rule.	Paragraph 21 (d)

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
3	LRM - MAS - HQLA Level 1 - Sovereign, Central Bank and MDB Guaranteed Zero Risk Weight Securities	This rule reclassifies marketable zero risk weight securities, guaranteed by sovereigns, central banks, public sector enterprises, regional governments, municipalities, state agencies, state enterprises, Bank for International Settlements, International Monetary Fund, European Central Bank, European Community and Multilateral Development Banks as HQLA Level 1 assets, in accordance with the criteria specified by MAS.	The classification of marketable zero risk weight securities, guaranteed by sovereigns, central banks, public sector enterprises, regional governments, municipalities, state agencies, state enterprises, Bank for International Settlements, International Monetary Fund, European Central Bank, European Community and Multilateral Development Banks as HQLA Level 1 assets is configured as part of this rule.	Paragraph 21 (d)
4	LRM - MAS - HQLA Level 1 - Sovereign and Central Bank Non-Zero Risk Weight Securities	This rule reclassifies non-zero risk weight securities issued by foreign sovereigns and central banks as HQLA Level 1 assets, in accordance with the criteria specified by MAS.	The classification of marketable securities, issued by non-zero risk weight foreign sovereigns and central banks as HQLA Level 1 assets is configured as part of this rule.	Paragraph 21 (g) Paragraph 21 (h)
5	LRM - MAS - HQLA Level 2A - Debt Securities	This rule reclassifies 20 percent risk weighted securities issued or guaranteed by sovereigns, central banks, PSEs, regional governments, municipalities, state agencies, state	The classification of twenty percent risk weighted marketable securities either issued or guaranteed by foreign sovereigns, central banks, public sector enterprises, regional governments, municipalities, state agencies, state enterprises and Multilateral Development Banks as HQLA Level 2A assets is configured as	Paragraph 21 (e)

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
		enterprises and MDBs as HQLA Level 2A assets, in accordance with the criteria specified by MAS.	part of this rule.	
6	LRM - MAS - HQLA Level 2A -Corporate Debt Securities, Sukuk	This rule reclassifies debt securities rated >=AA- issued by non-financial corporates, covered bonds and sukuk issued by other than Singapore Sukuk Pte Ltd. as HQLA Level 2A assets	The classification of >=AA- rated debt securities issued by non-financial corporates, covered bonds and sukuk issued by other than Singapore Sukuk Pte Ltd. as HQLA Level 2A assets is configured as part of this rule.	Paragraph 21 (i)
7	LRM - MAS - HQLA Level 2B(I) Asset	This rule reclassifies corporate debt securities rated A+ to A-, issued by non-financial corporates, and sukuk issued by other than Singapore Sukuk Pte Ltd. As HQLA Level 2A assets, in accordance with the criteria specified by MAS.	The classification of A+ to A- rated debt securities issued by non-financial corporates and sukuk issued by other than Singapore Sukuk Pte Ltd. as HQLA Level (II) non-RMBS assets is configured as part of this rule.	Paragraph 21 (j)
8	LRM - MAS - HQLA Level 2B(II) non-RMBS Asset - Corporate Dept Securities	This rule reclassifies debt securities rated BBB+ and BBB-, issued by specialized sovereigns, central banks, non-financial corporates and sukuk issued by other than Singapore Sukuk Pte Ltd. as HQLA	The classification of BBB+ and BBB- rated debt securities issued by sovereigns; central banks; non-financial corporates and sukuk issued by other than Singapore Sukuk Pte Ltd. as HQLA Level (II) non-RMBS assets is configured as part of this rule. Additionally, the classification of BBB+ and BBB- rated debt securities guaranteed by sovereigns and central banks	Paragraph 21 (f) Paragraph 21 (k)

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
		Level (II) non-RMBS assets, in accordance with the criteria specified by MAS.		
9	LRM - MAS - HQLA Level 2B(II) non-RMBS Asset - Shares	This rule reclassifies equities issued by non-financial entities as HQLA Level (II) non-RMBS assets as HQLA Level (II) non-RMBS assets, in accordance with the criteria specified by MAS.	The classification of common equities issued by non-financial entities as HQLA Level (II) non-RMBS assets is configured as part of this rule.	Paragraph 21 (m)
10	LRM - MAS - HQLA Level 2B(II) RMBS Asset	This rule reclassifies residential mortgage backed securities of >= AA ,without any restructured underlying , as HQLA level 2B assets in accordance with the criteria specified by MAS.	The classification of >= AA rated residential mortgage backed securities without any restructured underlying as HQLA level 2B(II) RMBS assets is configured as part of this rule.	Paragraph 21 (l)
11	LRM - MAS - Level 1 Stock Adjustment - Deduction	This rule identifies all secured lending and asset exchange transactions involving HQLA that mature within the LCR horizon which are, therefore, required to be unwound and reclassifies them to the appropriate adjustment rule. In case of secured lending	The identification of secured funding and asset exchange transactions required to be unwound and the amount to be deducted from the stock of level 1 assets due to such an unwind is configured as part of this rule.	Appendix 6 Paragraph 5

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
		transactions, where the collateral received is a non-level 1 HQLA, the type of adjustment to the stock of HQLA due to such an unwind is updated as deduction of the amount paid. In case of asset exchange transactions, where the collateral received is a non-level 1 HQLA and the collateral posted in a level 1 HQLA, the type of adjustment to the stock of HQLA due to such an unwind is updated as deduction of the collateral posted.		
12	LRM - MAS - Level 1 Stock Adjustment - Addition	This rule identifies all secured funding and asset exchange transactions involving HQLA that mature within the LCR horizon which are, therefore, required to be unwound and reclassifies them to the appropriate adjustment rule. In case of secured funding transactions, where the collateral posted is a non-level 1 HQLA, the type of adjustment to the stock of	The identification of secured lending and asset exchange transactions required to be unwound and the amount to be added to the stock of level 1 assets due to such an unwind is configured as part of this rule.	Appendix 6 Paragraph 6

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
		HQLA due to such an unwind is updated as addition of the amount received. In case of asset exchange transactions, where the collateral posted is a non-level 1 HQLA and the collateral received in a level 1 HQLA the type of adjustment to the stock of HQLA due to such an unwind is updated as addition of the collateral received.		
13	LRM - MAS - Level 2A Stock Adjustment - Deduction	This rule identifies all secured funding and asset exchange transactions involving HQLA that mature within the LCR horizon which are, therefore, required to be unwound and reclassifies them to the appropriate adjustment rule. In case of secured funding transactions, where the collateral posted is a level 2A HQLA, the type of adjustment to the stock of HQLA due to such an unwind is updated as deduction of the collateral posted. In case of asset exchange	The identification of secured lending and asset exchange transactions required to be unwound and the amount to be deducted from the stock of level 2A assets due to such an unwind is configured as part of this rule.	Appendix 6 Paragraph 7

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
		transactions, where the collateral received is an HQLA and the collateral posted is a level 2A asset, the type of adjustment to the stock of HQLA due to such an unwind is updated as deduction of the collateral posted.		
14	LRM - MAS - Level 2A Stock Adjustment - Addition	This rule identifies all secured lending and asset exchange transactions involving HQLA that mature within the LCR horizon which are, therefore, required to be unwound and reclassifies them to the appropriate adjustment rule. In case of secured lending transactions, where the collateral received is a level 2A HQLA, the type of adjustment to the stock of HQLA due to such an unwind is updated as addition of the collateral received. In case of asset exchange transactions, where the collateral posted is an HQLA and the collateral received is a level 2A asset, the type	The identification of secured funding and asset exchange transactions required to be unwound and the amount to be added to the stock of level 2A assets due to such an unwind is configured as part of this rule.	Appendix 6 Paragraph 8

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
		of adjustment to the stock of HQLA due to such an unwind is updated as addition of the collateral received.		
15	LRM - MAS - Level 2B(I) Stock Adjustment - Deduction	This rule identifies all secured funding and asset exchange transactions involving HQLA that mature within the LCR horizon which are, therefore, required to be unwound and reclassifies them to the appropriate adjustment rule. In case of secured funding transactions, where the collateral posted is a level 2B(I) HQLA, the type of adjustment to the stock of HQLA due to such an unwind is updated as deduction of the collateral posted. In case of asset exchange transactions, where the collateral received is an HQLA and the collateral posted is a level 2B(I) asset, the type of adjustment to the stock of HQLA due to such an unwind is updated as deduction of	The identification of secured lending and asset exchange transactions required to be unwound and the amount to be deducted from the stock of Level 2B(I) assets due to such an unwind is configured as part of this rule.	Appendix 6 Paragraph 9

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
		the collateral posted.		
16	LRM - MAS - Level 2B(I) Stock Adjustment - Addition	This rule identifies all secured lending and asset exchange transactions involving HQLA that mature within the LCR horizon which are, therefore, required to be unwound and reclassifies them to the appropriate adjustment rule. In case of secured lending transactions, where the collateral received is a level 2B HQLA, the type of adjustment to the stock of HQLA due to such an unwind is updated as addition of the collateral received. In case of asset exchange transactions, where the collateral posted is an HQLA and the collateral received is a level 2B asset, the type of adjustment to the stock of HQLA due to such an unwind is updated as addition of the collateral received.	The identification of secured funding and asset exchange transactions required to be unwound and the amount to be added to the stock of level 2B(I) assets due to such an unwind is configured as part of this rule.	Appendix 6 Paragraph 10

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
17	LRM - MAS - Level 2B(II) RMBS Stock Adjustment - Deduction	This rule identifies all secured lending and asset exchange transactions involving HQLA that mature within the LCR horizon which are, therefore, required to be unwound and reclassifies them to the appropriate adjustment rule. In case of secured lending transactions, where the collateral received is a level 2B(II) RMBS HQLA, the type of adjustment to the stock of HQLA due to such an unwind is updated as deduction of the collateral received. In case of asset exchange transactions, where the collateral posted is an HQLA and the collateral received is a level 2B(II) RMBS asset, the type of adjustment to the stock of HQLA due to such an unwind is updated as deduction of the collateral received.	The identification of secured lending and asset exchange transactions required to be unwound and the amount to be deducted from the stock of Level 2B(II) RMBS assets due to such an unwind is configured as part of this rule.	Appendix 6 Paragraph 11

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
18	LRM - MAS - Level 2B(II) RMBS Stock Adjustment - Addition	This rule identifies all secured funding and asset exchange transactions involving HQLA that mature within the LCR horizon which are, therefore, required to be unwound and reclassifies them to the appropriate adjustment rule. In case of secured funding transactions, where the collateral posted is a level 2B(II) RMBS HQLA, the type of adjustment to the stock of HQLA due to such an unwind is updated as addition of the collateral posted. In case of asset exchange transactions, where the collateral received is an HQLA and the collateral posted is a level 2B(II) RMBS asset, the type of adjustment to the stock of HQLA due to such an unwind is updated as addition of the collateral posted.	The identification of secured funding and asset exchange transactions required to be unwound and the amount to be added to the stock of Level 2B(II) RMBS assets due to such an unwind is configured as part of this rule.	Appendix 6 Paragraph 12

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
19	LRM - MAS - Level 2B(II) Non-RMBS Stock Adjustment - Deduction	This rule identifies all secured lending and asset exchange transactions involving HQLA that mature within the LCR horizon which are, therefore, required to be unwound and reclassifies them to the appropriate adjustment rule. In case of secured lending transactions, where the collateral received is a level 2B(II) Non-RMBS HQLA, the type of adjustment to the stock of HQLA due to such an unwind is updated as deduction of the collateral received. In case of asset exchange transactions, where the collateral posted is an HQLA and the collateral received is a level 2B(II) Non-RMBS asset, the type of adjustment to the stock of HQLA due to such an unwind is updated as deduction of the collateral received.	The identification of secured lending and asset exchange transactions required to be unwound and the amount to be deducted from the stock of Level 2B(II) Non-RMBS assets due to such an unwind is configured as part of this rule.	Appendix 6 Paragraph 13

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
20	LRM - MAS - Level 2B(II) Non-RMBS Stock Adjustment - Addition	This rule identifies all secured funding and asset exchange transactions involving HQLA that mature within the LCR horizon which are, therefore, required to be unwound and reclassifies them to the appropriate adjustment rule. In case of secured funding transactions, where the collateral posted is a level 2B(II) Non-RMBS HQLA, the type of adjustment to the stock of HQLA due to such an unwind is updated as addition of the collateral posted. In case of asset exchange transactions, where the collateral received is an HQLA and the collateral posted is a level 2B(II) Non-RMBS asset, the type of adjustment to the stock of HQLA due to such an unwind is updated as addition of the collateral posted.	The identification of secured funding and asset exchange transactions required to be unwound and the amount to be added to the stock of Level 2B(II) Non-RMBS assets due to such an unwind is configured as part of this rule.	Appendix 6 Paragraph 14
21	LRM - MAS - Bank Own Assets - Meets HQLA	This rule reclassifies corporate debt securities rated A+ to A-, issued by	The identification of whether an asset owned by the bank meets the operational requirements set forth by MAS for its inclusion in	Paragraph 22

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
	Operational Requirements Flag Update	non-financial corporates, and sukuk issued by institutions other than Singapore Sukuk Pte Ltd. As HQLA Level 2A assets, in accordance with the criteria specified by MAS.	the stock of HQLA is configured as part of this rule.	
22	LRM - MAS - Mitigants - Meets HQLA Operational Requirements Flag Update	This rule reclassifies debt securities rated BBB+ and BBB-, issued by specialized sovereigns, central banks, non-financial corporates and sukuk issued by other than Singapore Sukuk Pte Ltd. as HQLA Level (II) non-RMBS assets, in accordance with the criteria specified by MAS.	The identification of whether the collateral received from counterparty meets the operational requirements set forth by MAS is configured as part of this rule.	Paragraph 22
23	LRM - MAS - Re-hypothecated Mitigants - Meets HQLA Operational Requirements Flag Update	This rule reclassifies equities issued by non-financial entities as HQLA Level (II) non-RMBS assets as HQLA Level (II) non-RMBS assets, in accordance with the criteria specified by MAS.	The identification of whether a collateral received from a counterparty, that is further placed as collateral, meets the operational requirements set forth by MAS on unwind is configured as part of this rule.	Paragraph 22
24	LRM - MAS - Instruments - Eligible High Quality Liquid Assets Flag Update	This rule reclassifies residential mortgage backed securities of >= AA,without any restructured	The identification of whether a bank's asset classified as an HQLA, meets all the operational criteria and is therefore eligible to be included in the stock of HQLA is configured as part of this	Paragraph 22

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
		underlying, as HQLA level 2B assets in accordance with the criteria specified by MAS.	rule.	
25	LRM - MAS - Mitigants - Eligible High Quality Liquid Assets Flag Update	This rule identifies all secured lending and asset exchange transactions involving HQLA that mature within the LCR horizon which are, therefore, required to be unwound and reclassifies them to the appropriate adjustment rule. In case of secured lending transactions, where the collateral received is a non-level 1 HQLA, the type of adjustment to the stock of HQLA due to such an unwind is updated as deduction of the amount paid. In case of asset exchange transactions, where the collateral received is a non-level 1 HQLA and the collateral posted in a level 1 HQLA, the type of adjustment to the stock of HQLA due to such an unwind is updated as deduction of	The identification of whether the collateral received from counterparty, classified as an HQLA, meets all the operational criteria and is therefore eligible to be included in the stock of HQLA is configured as part of this rule.	Paragraph 22

Sl. No.	**Rule Name**	**Rule Description**	**Regulatory Requirement Addressed**	**Regulatory Reference** **MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio**
		the collateral posted.		

2.3.2 Regulation Addressed through Business Assumptions

The application supports multiple assumptions with pre-configured rules and scenarios based on regulator specified scenario parameters such as HQLA haircuts, inflow and outflow percentage / rates and so on. The list of pre-configured business assumptions and the corresponding reference to the regulatory requirement that it addresses is provided in the following table:

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
Inflow				
1	MAS-Secured lending inflows where collateral is not resued	Inflows from secured lending transactions, where the collateral received is not reused to cover the customer or firm short positions	The inflow rate on secured lending transactions where the collateral received is not reused to cover customer or firm short positions, are pre-defined as part of this assumption. This assumption applies 0%, 15%, 25%, 50% and 100% inflow rate when collateral received is Level 1, Level 2A, Level 2B(I), Level 2B(II) RMBS, Level 2B(II) non-RMBS and non-HQLA respectively, on secured balance per collateral (i.e. used portion of Collateral) for secured lending transactions specified earlier.	Paragraph 92
2	MAS-Secured lending inflow where collateral reused for <=30d	Inflows from secured lending transactions, where the collateral received is reused to cover the customer or firm short positions for a period less than the LCR horizon.	The inflow rate on secured lending transactions where the collateral received is reused to cover customer or firm short positions, for a period less than the LCR horizon, are pre-defined as part of this assumption. This assumption applies 0%, 15%, 25%, 50% and 100% inflow rate when collateral received is Level 1, Level 2A, Level	Paragraph 92

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
			2B(I), Level 2B(II) RMBS, Level 2B(II) non-RMBS and non-HQLA respectively, on secured balance per collateral (i.e. used portion of Collateral) for secured lending transactions specified earlier.	
3	MAS-Secured lending inflow where collateral reused for >30d	Inflows from secured lending transactions, where the collateral received is reused to cover the customer or firm short positions for a period greater than the LCR horizon.	The inflow rate on secured lending transactions where the collateral received is reused to cover customer or firm short positions for a period more than the LCR horizon, are pre-defined as part of this assumption. This assumption applies a 0% inflow rate on secured balance per collateral (i.e. used portion of Collateral) for secured lending transactions specified earlier.	Paragraph 93
4	MAS-Drawdowns on Committed Funding Facilities	Drawdowns on committed facilities received by the bank.	The inflow rate on the undrawn amount available for drawdown, on the committed credit, liquidity and other contingent funding facilities received by the bank, is pre-defined as part of this assumption. This assumption applies a 0% inflow rate on the credit and liquidity lines received by the bank.	Paragraph 99
5	MAS-Inflows from fully performing loans	Inflows from fully performing loans, which have a specified maturity and are extended to retail customers, SMEs, non-financial Corporates, sovereigns, central banks, multilateral development banks, PSEs and	The inflow rate on the fully performing loans and leases is pre-defined as part of this assumption. This assumption applies a 50 % inflow (i.e. 50% rollover) on cash flows occurring within the LCR horizon from loans and leases extended to retail customers, SMEs, Sovereigns, MDBs,	Paragraphs 102 and 103

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
		central banks.	PSEs and non-financial corporate. Additionally, it applies a 100% inflow (i.e. 0% rollover) on cash flow occurring within LCR horizon from loans and leases extended to central bank.	
6	MAS-Other entity inflows from fully performing loans	Inflows from fully performing loans, which have a specified maturity and are extended to wholesale customers other than SMEs, non-financial corporates, sovereigns, central banks, multilateral development banks, PSEs and central banks.	The inflow rate on the fully performing loans and leases is pre-defined as part of this assumption. This assumption applies a 50 % inflow (i.e. 50% rollover) on cash flows occurring within LCR horizon from loans and leases extended to non-financial entities apart from corporates. Additionally, it applies 100% inflow (i.e. 0% rollover) on cash flow occurring within LCR horizon from loans and leases extended to financial entities.	Paragraph 103
7	MAS-Inflows from deposits placed at financial entities	Inflows from deposits held with other financial institutions and deposits held with the centralized institution of a cooperative banking network.	The inflow rate on deposits placed at banks or financial entities is pre-defined as part of this assumption. This assumption applies a 0% inflow (i.e. 100% rollover) on cash flows from deposits placed with other financial institutions and deposits placed with the centralized institution of a cooperative banking network.	Paragraphs 105 and 108
8	MAS-Open maturity loan minimum payment inflows	Inflows due to minimum payments received within the LCR horizon on open maturity loans.	The inflow rate on the minimum payments that are contractually due within the LCR horizon, on an open maturity loans, credit cards, overdrafts, leases or line of credits are pre-defined as part of this assumption. This	Paragraph 101

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
			assumption applies a 100% inflow on such minimum amount dues to central bank and financial customers. Additionally, it applies a 50% inflow on minimum amount dues to retail and non-financial customers.	
9	MAS-Revolving, non-maturity, non-performing inflow exclusion	Exclusion of inflows from revolving products, products that do not have a specified maturity, and products that are not fully performing.	The exclusion of cash inflows from revolving assets, assets that do not have a stated maturity and assets that are not fully performing is pre-defined as part of this assumption. This assumption applies a 0% inflow (i.e. 100% rollover) on the principal inflows from open maturity fully performing assets. Additionally, it applies a 0% inflow (i.e. 100% rollover) on the inflows from non-performing assets.	Paragraph 100
10	MAS-Non-HQLA security inflows	Inflows from securities not included in the stock of HQLA.	The inflow rate on the performing debt securities that are excluded from the stock of HQLA is pre-defined as part of this assumption. This assumption applies a 100% inflow (i.e. 0% rollover) on cash flows from securities classified as Other Assets, and securities classified as HQLA but do not meet the eligibility criteria for inclusion in the stock of HQLA. It also applies a 0% inflow (i.e. 100% rollover) on non-performing securities or securities that are classified as HQLA and meet the criteria for inclusion in the stock of HQLA, to avoid double counting.	Paragraph 104

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
11	MAS-Inflow from intra-group transactions	Inflows from net intra-group transactions.	Inflows from net intra-group transactions are pre-defined as part of this assumption. This assumption applies a 100% inflow if the netted value of cash flows at group level is positive. Another assumption, MAS-Outflow from intra-group transactions, applies a 100% outflow if the netted value of cash flows at group level is negative.	Paragraph 106
12	MAS-Derivative cash inflows	Net cash outflows from derivative transactions.	The inflow rate on the 30-day cash inflows from derivative transactions is pre-defined as part of this assumption. This assumption applies a 100% inflow on derivative cash inflows, on a net basis in case of derivatives, which are part of a netting agreement, and on a non-net basis for other derivatives.	Paragraph 107
13	MAS-Funding loss inflow on structured financing Instruments	Inflows from loss of funding on asset-backed securities, covered bonds and other structured financing instruments.	The run-off rate on the maturing asset-backed securities, covered bonds and other structured financing instruments is pre-defined as part of this assumption. This assumption applies a 100% run-off on EOP Balance Net of Underlying HQLA for structured financing instruments that mature within the LCR horizon.	Paragraphs 71 and 108
Outflow				

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
14	MAS-Highly Stable retail deposits run-off	Run-offs on the highly stable portion of deposits from retail customers, and unsecured wholesale fundings from SMEs treated as retail.	The outflow rate on the highly stable portion of deposits, from retail customers and SMEs treated as retail customers, for the purpose of LCR, is pre-defined as part of this assumption. This assumption applies a 3% run-off on the highly stable portion of retail deposits that are either not encumbered, or the encumbrance period is less than LCR horizon, which either mature or result in an early withdrawal, without incurring significant penalty, within the LCR horizon.	Paragraphs 37, 40, 55 and Footnote 15
15	MAS-Unencumbered part of highly stable retail deposit runoff	Run-offs on the unencumbered less stable portion of deposits from retail customers, and unsecured wholesale fundings from SMEs treated as retail, that have encumbrance period beyond the LCR horizon.	The outflow rate on the unencumbered portion of stable deposits, from retail customers and SMEs treated as retail customers, for the purpose of LCR, is pre-defined as part of this assumption. This assumption applies a 3% run-off on unencumbered portion of stable deposit, having encumbrance period more than LCR horizon, which either mature or result in an early withdrawal, without incurring significant penalty, within the LCR horizon.	Paragraphs 37, 40, 55 and Footnote 15
16	MAS-Stable retail deposits run-off	Run-offs on the stable portion of deposits from retail customers, and unsecured wholesale fundings from SMEs treated as retail.	The outflow rate on the stable portion of deposits, from retail customers and SMEs treated as retail customers, for the purpose of LCR, is pre-defined as part of this assumption. This assumption applies a 5% run-off on the stable portion of retail deposits that are either not	Paragraphs 37,40,45 and 55

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
			encumbered, or encumbrance period is less than the LCR horizon, which either mature or result in an early withdrawal, without incurring significant penalty, within the LCR horizon.	
17	MAS-Unencumbered part of stable retail deposit runoff	Run-offs on the unencumbered stable portion of deposits from retail customers, and unsecured wholesale fundings from SMEs treated as retail.	The outflow rate on the unencumbered portion of stable deposits, from retail customers and SMEs treated as retail customers, for the purpose of LCR, is pre-defined as part of this assumption. This assumption applies a 5% run-off on unencumbered portion of stable deposits, having encumbrance period more than the LCR horizon, which either mature or result in an early withdrawal, without incurring significant penalty, within the LCR horizon.	Paragraphs 37,40,45 and 55
18	MAS-Less Stable retail deposits run-off	Run-offs on the less stable portion of deposits from retail customers, and unsecured wholesale fundings from SMEs treated as retail, that are either not pledged, or have encumbrance period within the LCR horizon	The outflow rate on the less stable portion of deposits, from retail customers and SMEs treated as retail customers, for the purpose of LCR, is pre-defined as part of this assumption. This assumption applies a 10% run-off on the less stable portion of retail deposits that are either not encumbered, or encumbrance period is less than the LCR horizon, which either mature or result in an early withdrawal, without incurring significant penalty, within the LCR horizon.	Paragraphs 37,39,40, 45 and 55

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
19	MAS-Unencumbered part of less stable retail deposit runoff	Run-offs on the unencumbered less stable portion of deposits from retail customers, and unsecured wholesale fundings from SMEs treated as retail, that have encumbrance period beyond the LCR horizon.	The outflow rate on the unencumbered portion of less stable deposits, from retail customers and SMEs treated as retail customers, for the purpose of LCR, is pre-defined as part of this assumption. This assumption applies a 10% run-off on unencumbered portion of less stable deposit, having encumbrance period more than the LCR horizon, which either mature or result in an early withdrawal, without incurring significant penalty, within the LCR horizon.	Paragraphs 37,39,40, 45 and 55
20	MAS-Insured operational balance run-off	Run-offs on the portion of operational balances from deposits generated by clearing, custody and cash management activities that is fully covered by deposit insurance.	The run-off rates on the insured portion of the balance held in operational accounts to fulfill operational requirements are pre-defined as part of this assumption. This assumption applies a 3% run-off on insured operational balances that meet the additional criteria for deposit insurance schemes and a 5% run-off on those that do not meet the additional criteria.	Paragraph 46 to 52
21	MAS-Uninsured operational balance run-off	Run-offs on the portion of operational balances from deposits generated by clearing, custody and cash management activities that is not covered by deposit insurance.	The run-off rates on the uninsured portion of the balance held in operational accounts to fulfill operational requirements are pre-defined as part of this assumption. This assumption applies a 25% run-off on operational balances that are not covered by deposit insurance.	Paragraph 46 to 52

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
22	MAS- Deposits in institutional network of Co-op banks runoff	Run-offs on deposits placed with the central institutions, or specialised central service providers of an institutional network of co-operative banks due to statutory minimum deposit requirements, or in the context of common task sharing and legal, statutory or contractual arrangements.	The run-off rates on deposits placed by a member institution with the central institution or specialized central service providers of an institutional network of co-operative banks are pre-defined as part of this assumption. This assumption applies a 75% rollover i.e. a 25% run-off on deposits in institutional networks of cooperative banks, which are non-operational in nature, placed due to statutory minimum deposit requirements or in the context of common task sharing and legal, statutory or contractual arrangements.	Paragraph 53 to 54
23	MAS-Outflows from correspondent banking	Outflows from deposits arising out of correspondent banking relationship.	The run-off rates from vostro balances are pre-defined as part of this assumption. This assumption applies a 100% run-off on EOP balance.	Paragraph 54
24	MAS-Outflows on unsecured non-operational funding	Run-offs on the unsecured wholesale fundings, provided by SMEs, non-financial corporates, sovereigns, central banks, multilateral development banks and PSEs, that are not classified as operational deposits.	The run-off rates on the cash flows, from unsecured fundings that are not classified as operational deposits, received from SME's and non-financial corporates treated as wholesale customers, sovereigns, central banks, multilateral development banks and PSEs, are pre-defined as part of this assumption. This assumption applies a 80% rollover i.e. 20% run-off on cash flows from non-operational funding accounts that are fully covered by deposit insurance and a 60% rollover i.e. 40% run-off	Paragraph 56

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
			on those non-operational funding accounts that are not fully covered by deposit insurance.	
25	MAS-Outflows on non-operational part of operational account	Run-offs on unsecured wholesale funding, from wholesale customers other than SMEs, non-financial corporates, sovereigns, central banks, multilateral development banks and PSEs, provided for non-operational	The run-off rates on the non-operational portion of operational deposits from non-financial corporates, sovereigns, central banks, multilateral development banks and PSEs, are pre-defined as part of this assumption. This assumption applies a 20% run-off on non-operational portion of operational deposits that are fully covered by deposit insurance and a 40% run-off on the non-operational portion of operational deposits that are not fully covered by deposit insurance.	Paragraph 56
26	MAS-Other legal entity unsecured wholesale funding run-off	Run-offs on unsecured wholesale funding, from wholesale customers other than SMEs, non-financial corporates, sovereigns, central banks, multilateral development banks and PSEs, provided for non-operational purposes.	The run-off rates on the cash flows, from unsecured fundings that not classified as operational deposits, received from all financial counterparties other than SME's and non-financial corporates, sovereigns, central banks, multilateral development banks and PSEs, are pre-defined as part of this assumption. This assumption applies a 0% rollover i.e. 100% run-off on cash flows from non-operational funding.	Paragraph 57

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
27	MAS-Co-operative Bank unsecured wholesale funding run-off	Run-offs on unsecured wholesale funding from credit co-operative banks provided for non-operational purposes.	The run-off rates on the cash flows, from unsecured fundings that not classified as operational deposits, received from credit co-operative banks are pre-defined as part of this assumption. This assumption applies a 0% rollover i.e. 100% run-off on cash flows from non-operational funding.	Paragraph 57
28	MAS-Run-off on nonoperational balance of other entities	Run-offs on the non-operational portion of unsecured wholesale fundings provided by customers other than SMEs, non-financial corporates, sovereigns, central banks, multilateral development banks and PSEs that are classified as operational deposits.	The run-off rates on the non-operational portion of operational deposits received from all financial counterparties other than SME's and non-financial corporates, sovereigns, central banks, multilateral development banks and PSEs, are pre-defined as part of this assumption. This assumption applies a 100% run-off on non-operational portion of operational deposits.	Paragraph 57
29	MAS-Runoff from issued debt security	Outflows on debt securities issued by the bank itself.	The run-off rates on the debt securities issued by the bank itself are pre-defined as part of this assumption. This assumption applies a 90% rollover i.e. 10% run-off on issued securities that are sold exclusively in the retail market and held in retail accounts, and 0% rollover i.e. 100% run-off on all other issued securities.	Paragraph 58

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
30	MAS-Outflow from intra-group transactions	Outflows from net intra-group transactions	Outflows from net intra-group transactions are pre-defined as part of this assumption. This assumption applies 100% outflow if the netted value of cash flows at group level is negative. Another assumption, MAS-Inflow from intra-group transactions applies 100% inflow if the netted value of cash flows at group level is positive.	Paragraph 57
31	MAS-Secured funding run-off	Run-offs on secured fundings, excluding collateral swaps.	The run-off rates on the secured funding, excluding collateral swaps, received from sovereigns, central banks, multilateral development banks and PSEs, are pre-defined as part of this assumption. This assumption applies the regulatory run-offs applicable to each counterparty type in the form of rollover rates i.e. 1 – run-off rates.	Paragraphs 60 to 69
32	MAS-Secured funding run-off from other legal entities	Run-off on secured funding, excluding collateral swaps, received from counterparties other than sovereigns, central banks, multilateral development banks and PSEs where the transaction is backed by level 2B(I), level 2B(II) non-RMBS or other assets.	The run-off rates on the secured funding, excluding collateral swaps, received from counterparties other than sovereigns, central banks, multilateral development banks and PSEs, where the transaction is backed by level 2B(I), level 2B(II) non-RMBS or other assets, are pre-defined as part of this assumption. This assumption applies the regulatory run-offs applicable to other counterparties, based on the asset quality of the placed collateral, in the form of rollover rates i.e. 1 – run-off	Paragraphs 60 to 69

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
			rates.	
33	MAS-Outflows from deliverable derivatives	Outflows from derivatives with physical delivery settlement	The outflow rate on the 30-day cash outflows from derivative transactions which are physically delivered is pre-defined as part of this assumption. This assumption applies the regulatory run-offs applicable to other counterparties, based on the asset quality of the delivered assets, in the form of rollover rates i.e. 1 – run-off rates.	Paragraphs 60 to 64
34	MAS-Deliverable derivatives outflows from other entities	Outflows from derivatives, with physical delivery settlement, from all counterparties other than sovereigns, MDBs and PSEs.	The outflow rate on the 30-day cash outflows from derivative transactions which are physically delivered is pre-defined as part of this assumption. This assumption applies the regulatory run-offs applicable to counterparties other than sovereigns, MDB and PSE, based on the asset quality of the delivered assets, in the form of rollover rates i.e. 1 – run-off rates.	Paragraphs 60 to 64
35	MAS-Derivative cash outflows	Net cash outflows from derivative transactions.	The outflow rate on the 30-day cash outflows from derivative transactions is pre-defined as part of this assumption. This assumption applies a 100% outflow on derivative cash outflows, on a net basis in case of derivatives which are part of a netting agreement and on a non-net basis for other derivatives.	Paragraph 64

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
36	MAS-Rating downgrade related collateral outflow	Increased liquidity needs arising from the requirement to post an additional collateral due to a 3-notch ratings downgrade.	The outflow rate, on the additional collateral required to be posted on contracts with downgrade triggers, due to a 3-notch ratings downgrade, is pre-defined as part of this assumption. This assumption applies a 100% outflow on the downgrade impact amount arising from a 3-notch ratings downgrade.	Paragraph 65
37	MAS-Re-hypothecation rights lost due to rating downgrade	Increased liquidity needs arising from a loss of re-hypothecation rights on assets received as collateral due to a 3-notch ratings downgrade.	The outflow rate, on the additional cash outflows arising on contracts with downgrade triggers, resulting in a loss of re-hypothecation rights due to a 3-notch ratings downgrade, is pre-defined as part of this assumption. This assumption applies a 100% outflow on the value of mitigants received under re-hypothecation rights corresponding to accounts whose downgrade trigger is activated due to the 3-notch ratings downgrade.	Paragraph 65
38	MAS-Increased liquidity needs due to collateral value change	Increased liquidity needs arising from the potential change in the value of a posted collateral.	The outflow rate on the additional cash outflow due to a potential loss in the market value of non-level 1 assets posted as collateral is pre-defined as part of this assumption. This assumption applies a 100% outflow on the value of non-level 1 posted collateral computed after netting the non-level 1 collateral received under re-hypothecation rights on the same transaction.	Paragraph 66

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
39	MAS-Outflow of excess collateral	Increased liquidity needs arising from excess non-segregated collateral received that can be recalled by the counterparty.	The outflow rate on the excess unsegregated collateral held by a bank, which can potentially be withdrawn by the counterparty, is pre-defined as part of this assumption. This assumption applies a 100% outflow on the value of excess collateral.	Paragraph 67
40	MAS-Outflow of contractually due collateral	Increased liquidity needs arising from collaterals that are contractually required to be posted to the counterparty but has not yet been posted.	The outflow rate on the collateral that the bank is contractually required to post to its counterparty, but has not yet posted, is pre-defined as part of this assumption. This assumption applies a 100% outflow on the value of contractually due collateral.	Paragraph 68
41	MAS-Outflows from substitutable collateral	Increased liquidity needs arising from contracts that allow a counterparty to substitute lower quality collateral for the current higher quality collateral.	The outflow rate on the collateral that the counterparty can contractually substitute with lower quality collateral is pre-defined as part of this assumption. This assumption applies an outflow rate equal to the difference between the liquidity haircuts of collateral that can be potentially substituted by the counterparty and the collateral that substitutes it.	Paragraph 69
42	MAS-Increased liquidity need due to market valuation change	Increased liquidity needs arising from market valuation changes on derivatives and other transactions.	The outflow rate on the collateral outflows occurring due market valuation changes on derivative and other transactions, is pre-defined as part of this assumption. This assumption applies a 100% outflow rate on the largest absolute net 30-day collateral flow occurring	Paragraph 70

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
			during the preceding 24 months under the historical look-back approach.	
43	MAS-Loss of Funding on Structured Financing Instruments	Loss of funding on asset-backed securities, covered bonds and other structured financing instruments.	The run-off rate on the maturing asset-backed securities, covered bonds and other structured financing instruments, is pre-defined as part of this assumption. This assumption applies a 100%run-off on EOP Balance Net of Underlying HQLA for structured financing instruments that mature within the LCR horizon.	Paragraph 71
44	MAS-Loss of Funding from Financing Facility-Liquidity Draws	Loss of funding on asset-backed commercial papers, conduits, securities investment vehicles and other such financing facilities due to drawdown of liquidity facilities provided by the bank.	The outflow rate on the undrawn amount available to be drawn down on the liquidity facility extended to the structured financing facility, is pre-defined as part of this assumption. This assumption applies a 100% outflow as a drawdown rate on the liquidity facilities extended as support for structured financing purposes.	Paragraph 72
45	MAS-Loss of Funding from Financing Facility-Maturing debt	Loss of funding on asset-backed commercial papers, conduits, securities investment vehicles and other such financing facilities due to inability to refinance the maturing debt.	The run-off rate on the maturing amounts of asset-backed commercial papers, conduits, securities investment vehicles and other such financing facilities, is pre-defined as part of this assumption. This assumption applies a 100% run-off on the EOP balance of the structured financing facilities that mature within the LCR horizon.	Paragraph 72

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
46	MAS-Loss of Funding from Financing Facility-Return of assets	Loss of funding on asset-backed commercial papers, conduits, securities investment vehicles and other such financing facilities due to potential return of assets.	The run-off rate on the returnable assets underlying asset-backed commercial papers, conduits, securities investment vehicles and other such financing facilities is pre-defined as part of this assumption. This assumption applies a 100% run-off on the value of the assets that are returnable within the LCR horizon.	Paragraph 72
47	MAS-Draws on committed credit and liquidity facilities	Drawdowns on committed credit and liquidity facilities extended to retail customers, SMEs, non-financial corporates and PSEs, sovereigns, central banks, MDBs and banks excluding SPEs.	The outflow rate on the undrawn amount available to be drawn down on the committed credit and liquidity facilities extended to retail customers, non-financial corporates and PSEs, sovereigns, central banks and MDBs is pre-defined as part of this assumption. This assumption applies the relevant outflow as a drawdown rate, based on the counterparty type, for the aforementioned counterparties.	Paragraphs 73 to 79
48	MAS-Draws on committed facility to other FI,legal entity	Drawdowns on committed credit and liquidity facilities extended to entities other than retail customers, SMEs, non-financial corporates and PSEs, sovereigns, central banks, MDBs, PSEs and banks excluding SPEs. Additionally, drawdowns on committed credit and liquidity facilities extended to hedge funds, money market	The outflow rate on the undrawn amount available to be drawn down on the committed credit and liquidity facilities extended to customers other than retail customers, non-financial corporates and PSEs, sovereigns, central banks, MDBs, hedge funds, mutual funds, SPEs and banks is pre-defined as part of this assumption. This assumption applies the relevant outflow as a drawdown rate, based on the counterparty type.	Paragraphs 73 to 79

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
		funds and SPEs.		
49	Draws on committed credit and liquidity facility by bank	Drawdowns on committed credit and liquidity facilities extended to banks excluding SPEs.	The outflow rate on the undrawn amount available to be drawn down on the committed credit and liquidity facilities extended to customers, is pre-defined as part of this assumption. This assumption applies the relevant outflow as a drawdown rate, for banks excluding SPEs.	Paragraphs 73 to 79
50	MAS-Draws on facility to hedge and money market fund,SPE	Drawdowns on committed credit and liquidity facilities extended to hedge funds, money market funds and SPEs.	The outflow rate on the undrawn amount available to be drawn down on the committed credit and liquidity facilities extended to hedge funds, mutual funds and SPEs, is pre-defined as part of this assumption. This assumption applies the relevant outflow as a drawdown rate, based on the counterparty type.	Paragraph 77
51	MAS-Other contractual obligation to financial institution	Outflows related to other contractual obligations to extend funds within 30 days to financial institutions.	The outflow rate on other contractual obligations to extend funds to financial institutions, not covered in the previous assumptions, is pre-defined as part of this business assumption. This assumption applies a 100% outflow rate on such contractual obligations.	Paragraph 80
52	MAS-Other contractual obligation to nonfinancial institution	Outflows related to other contractual obligations to extend funds within 30 days to retail and non-financial wholesale counterparties.	The outflow rate on the other contractual obligations to extend funds to retail and non-financial corporate customers, in excess of 50% of contractual inflows from such customers within the LCR horizon, is pre-defined as	Paragraph 81

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
			part of this assumption. This assumption applies a 100% outflow on the excess contractual obligation amount.	
53	MAS-Other contractual obligation outflows	Outflows related to trade finance related instruments.	The outflow rate on guarantees, letter of credit and bills of exchange is pre-defined as part of this assumption. This assumption applies a 3% run-off on such instruments when used for the trade finance whereas 100% run-off is applied if used for non-trade finance related obligation.	Paragraphs 82 to 88
54	MAS-Uncommitted Facility Outflows	Drawdowns on uncommitted credit and liquidity facilities extended to customers.	The outflow rate on the undrawn amount available to be drawn down on the uncommitted credit and liquidity facilities extended to customers is pre-defined as part of this assumption. This assumption applies a 100% drawdown on the uncommitted facilities.	Paragraphs 82 to 88
55	MAS-Outflows Related to Short Positions	Outflows related to customer and bank short positions.	The outflow rate on the short positions is pre-defined as part of this assumption. This assumption specifies run-off rates on the short positions based on assets covering such short positions.	Paragraphs 82 to 88
56	MAS-Non-contractual obligation outflows	Outflows from non-contractual obligations related to joint ventures, minority investments, debt buy-back requests, structured products, managed funds and any other similar obligations	The outflow rate on the non-contractual obligations related to joint ventures, minority investments, debt buy-back requests, structured products, managed funds and any other similar obligations is pre-defined as part of this assumption. This assumption applies a 100% outflow rate	Paragraphs 82 to 88

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
			on the non-contractual obligations.	
57	MAS-Contractual interest payment outflows	Outflows related to contractual payments of interests.	The outflow rate on the interest payments contractually due within the LCR horizon, is pre-defined as part of this assumption. This assumption applies a 100% outflow on interest in the form of a 0% rollover rate.	Paragraph 89
58	MAS-Contractual dividend payment outflows	Outflows related to contractual payments of dividends.	The outflow rate on the dividends payable within the LCR horizon is pre-defined as part of this assumption. This assumption applies a 100% outflow on dividends payable.	Paragraph 89
Collateral Swap				
59	MAS-Outflows from collateral swaps	Outflows from collateral swap transactions	The outflow rates on collateral swaps are pre-defined as part of this assumption. This assumption applies the outflows applicable to the market value of received collateral, when the collateral placed under a swap transaction is of lower or equal quality than the collateral received, as the difference between the liquidity haircuts applicable to the placed and received collateral.	Paragraphs 60 to 63
60	MAS-Collateral swap inflows where collateral is not resued	Inflows from collateral swap transactions where the collateral received is not reused to cover customer or firm short positions.	The inflow rates on collateral swaps where the collateral received is not reused to cover customer or firm short positions, are pre-defined as part of this assumption. This assumption applies the inflows applicable to the market value of placed collateral, when the collateral placed	Paragraph 92

Sl. No.	Business Assumption Name	Business Assumption Description	Regulatory Requirement Addressed	Regulatory Reference MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio
			under a swap transaction is of higher or equal quality than the collateral received, as the difference between the liquidity haircuts applicable to the placed and received collateral.	
61	MAS-Collateral swap inflow where collateral reused for <=30d	Inflows from collateral swap transactions where the collateral received is reused to cover customer or firm short positions for a period less than the LCR horizon.	The inflow rates on collateral swaps where the collateral received is reused to cover customer or firm short positions for a period less than LCR horizon, are pre-defined as part of this assumption. This assumption applies the inflows applicable to the market value of placed collateral, when the collateral placed under a swap transaction is of higher or equal quality than the collateral received, as the difference between the liquidity haircuts applicable to the placed and received collateral.	Paragraph 92
62	MAS-Collateral swap inflow where collateral reused for >30d	Inflows from collateral swap transactions where the collateral received is reused to cover customer or firm short positions for a period greater than the LCR horizon.	The inflow rates on collateral swaps where the collateral received is reused to cover customer or firm short positions for a period more than LCR horizon, are pre-defined as part of this assumption. This assumption applies the inflows applicable to the market value of placed collateral, when the collateral placed under a swap transaction is of higher or equal quality than the collateral received, as the difference between the liquidity haircuts applicable to the placed and received collateral.	Paragraph 93

3 Net Stable Funding Ratio Calculation

Net Stable Funding Ratio (NSFR) is one of the two minimum standards developed to promote funding and liquidity management in financial institutions. NSFR assesses the bank's liquidity risks over a longer time horizon. Both the standards, complement each other, are aimed at providing a holistic picture of a bank's funding risk profile, and aid in better liquidity risk management practices.

3.1 Overview

NSFR is defined as the amount of available stable funding relative to the required stable funding. Available stable funding refers to the portion of capital and liabilities expected to be reliable over the horizon of 1 year. Required stable funding refers to the portion of assets and off balance sheet exposures over the same horizon. The NSFR ratio is expected to be at least 100%.

$$\left(\frac{Available\ stable\ funding}{Required\ stable\ funding}\right) \geq 100\%$$

3.2 Process Flow

The Available Stable Funding (ASF) factor and Required Stable Funding (RSF) factor is applied through business assumptions and reflects through the execution of a Business as Usual (BaU) run in the OFS LRRCMAS application. The ASF and RSF factors are applied as weights at the account level and the Total ASF and Total RSF is obtained by taking a sum of the all the weighted amounts. The ratio is then computed by the application as the (Total ASF amount)/(Total RSF amount) A set of pre-defined business assumptions for ASF and RSF as defined in the NSFR guidelines are prepackaged in the application. For the complete list of pre seeded ASF and RSF assumptions refer section Regulation Addressed through Business Assumptions.

- Identification of Maturity Bands
- Computation of Available Amount of Stable Funding
- Computation of Required Amount of Stable Funding
- Computation of Derivatives
- Computation of Net Stable Funding Ratio

3.2.1 Identification of Maturity bands

One of the various dimensions used to allocate ASF and RSF factors is the maturity bucket of the instrument. For NSFR computation, maturity bands are used to allocate the factors. The MAS NSFR band is pre-defined as per regulatory guidelines and has values as follows:

- Less than 6 months
- Greater than or equal to 6 months but less than 1 year
- Greater than or equal to one year
- Open maturity

All accounts will be categorized on one of the above bands depending on the maturity date. It must be noted that to categorize any product into open maturity, the Rule "LRM - Classification of Products as Open Maturity" has to be edited and the product must be included in the rule.

3.2.2 Computation of Available Amount of Stable Funding

The available stable funding factor is a pre-determined weight ranging from 0% to 100% which is applied through business assumptions for the accounts falling under the dimensional combinations defined. The weights are as guided by the NSFR standard. The available stable funding is then taken as a total of all the weighted amounts where an ASF factor is applied.

Foreign bank branches can account for the undrawn contractual committed facilities from its head office or other branches which are the same entity and are regional hubs as ASF up to 40% of the minimum ASF required to meet the minimum requirement of NSFR.

The formula for calculating Available Amount of Stable Funding is as follows:

$$\boldsymbol{Available\ Amount\ of\ Stable\ Funding = \sum_{i=1}^{n} Liability_i * Factor_i}$$

$$\boldsymbol{where\ n = The\ number\ of\ capital\ and\ liability\ accounts}$$

An example of the application of ASF factor is given below:

Consider an assumption defined with the following dimensional combination and ASF factors, with the based on measure being Total stable balance:

Dimensional Combination			ASF Factor
Product	**Retail/Wholesale Indicator**	**Residual Maturity Band**	
Deposits	R	<= 6 months	95%
Deposits	R	6 months - 1 year	95%
Deposits	R	>= 1 year	95%

If there are five accounts falling under the above combination, then after the assumption is applied the resulting amounts with application of ASF factors is as follows:

Account	Stable Balance	ASF Weighted Amount
A1	3400	3230
A2	3873	3679.35
A3	9000	8550
A4	1000	950
A5	100	95

NOTE: LRRCMAS application does not compute ASF items such as Tier 1 and Tier 2 capital, deferred tax liabilities, and minority interest. The items are taken as a download from the OFS Basel application. By updating the latest Basel Run Skey as a setup parameter, the LRRCMAS application picks up the respective standard accounting head balances and applies the respective ASF factors.

In case OFS Basel is not installed, then the items mentioned below must be provided as a download in FCT_STANDARD_ACCT_HEAD table.

- Gross Tier 2 Capital
- Deferred Tax Liability related to Other Intangible Asset
- Deferred Tax Liability related to Goodwill
- Deferred Tax Liability related to MSR
- Deferred Tax Liability related to Deferred Tax Asset
- Deferred Tax Liability related to Defined Pension Fund Asset
- Net CET1 Capital post Minority Interest Adjustment

- Net AT1 Capital post Minority Interest Adjustment
- Total Minority Interest required for NSFR

3.2.3 Computation of Required Amount of Stable Funding

The required stable funding factor is a pre-determined weight ranging from 0% to 100% which is applied through business assumptions for the accounts falling under the defined dimensional combinations. The weights are as guided by the NSFR standard. The required stable funding is then considered as a sum of all the weighted amounts where an RSF factor is applied.

The required stable funding factor is a weight function and is applied in a similar manner as that of the ASF. The formula which is used for calculating the Required Amount of Stable Funding is as follows:

$$\boldsymbol{Required\ Amount\ of\ Stable\ Funding} = \left(\sum_{i=1}^{n} \boldsymbol{Asset_i * Factor_i}\right) + \left(\sum_{i=1}^{m} \boldsymbol{Off\ Balance\ Sheet_i * Factor_i}\right)$$

$$\boldsymbol{where\ n = Number\ of\ asset\ accounts}$$

$$\boldsymbol{where\ m = Number\ of\ off\ balance\ sheet\ accounts}$$

3.2.3.1 Computation of Off Balance Sheet Items

Off balance sheet items are considered under the application of RSF factor, and are given the appropriate factor as guided. Some combinations such as line of credit have a pre-defined RSF factor as guided and are available as pre seeded assumptions. Other off balance sheet products such as Variable Rate Demand Notes (VRDN) and Adjustable Rate Notes (ARN) do not have pre-defined factors and are left to the discretion of the jurisdictions. For such products, the user can define assumptions and apply desired RSF factors as applicable.

3.2.4 Computation of Derivatives

Derivatives are handled through application of both ASF and RSF factors as applicable. They can behave as either an asset or a liability, depending on the marked to market value. Application of factors on derivatives is done on the market value after subtracting variation margin posted/received against the account. The computation is described below:

1. NSFR derivative liabilities = Derivative liabilities – (Total collateral posted as variation margin against the derivative liabilities)

2. NSFR derivative assets = Derivative assets – (Cash collateral received as variation margin against the derivative assets)
3. The factors are then applied as follows:
   - **ASF factor application**

     ASF amount for derivatives = 0% * Max ((NSFR derivative liabilities –NSFR derivative assets), 0)

   - **RSF factor application**

     RSF amount for derivatives = 100% * Max ((NSFR derivative assets- NSFR derivative liabilities), 0)

Derivative liabilities refer to those derivative accounts where the market value is negative. Derivative assets refer to those derivative accounts where the market value is positive. Apart from the variation margin, the initial margin against derivative contracts is also treated with the appropriate factor.

3.2.5 Computation of Net Stable Funding Ratio

The Net Stable Funding Ratio is calculated as follows:

$$\boldsymbol{Net\ Stable\ Funding\ Ratio} = \frac{\boldsymbol{Available\ Amount\ of\ Stable\ Funding}}{\boldsymbol{Required\ Amount\ of\ Stable\ Funding}}$$

3.3 Pre-configured MAS Regulatory NSFR Scenarios

OFS LRRCMAS supports out-of-the-box MAS NSFR assumptions according to MAS guidelines on the Net stable funding ratio.

This section explains the business assumptions which support NSFR as per MAS Notice 652 Net Stable Funding Ratio.

The below table lists the Document Identifiers provided in the column Regulatory Reference of Regulations Addressed through Business Assumptions.

Regulation Reference Number	Document Number	Document Name	Issued Date
MC	MAS 652	MAS Notice 652 Net Stable Funding Ratio	24 Apr 18

NOTE: This section gives only the contextual information about all the business assumptions. For more detailed information refer OFS LRS application (UI).

3.3.1 Regulation Addressed through Business Assumptions

The application supports multiple assumptions with pre-configured rules and scenarios based on regulator specified NSFR scenario parameters. The list of pre-configured business assumptions and the corresponding reference to the regulatory requirement that it addresses is provided in the following tables:

3.3.1.1 Available Stable Funding Factor

This section enlists all the pre seeded assumptions acting on liabilities and capital items which receive an ASF factor.

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
1	MAS ASF-Capital items, DTL and minority interest	ASF on gross tier 1, additional tier 1, tier 2 capital, Deferred tax liabilities and minority interest	This assumption defines the long-term funding sources with effective maturity of one year or more, primarily tier 1 and tier 2 capital instruments along with deferred tax liability and minority interest, which are assigned a 100% ASF factor for the NSFR computation.	Paragraph 6(a)
2	MAS ASF- Stable retail deposits with maturity less than 1yr	ASF on stable and highly stable deposits as defined in the LCR from customers treated as retail with a remaining maturity of less than a year.	The ASF factors applicable to the stable and highly stable portion of deposits, from retail customers and SMEs treated like retail customers for the purposes of LCR are pre-defined as part of this assumption. This assumption applies a 95% ASF factor on the stable and highly stable portion of the retail deposits with maturity of less than 1 year.	Paragraph 6(c), 7(a), 7(b)
3	MAS ASF- Stable retail deposits with maturity more than 1yr	ASF on stable and highly stable deposits as defined in the LCR from customers treated as retail with a remaining maturity of more than a year.	The ASF factors applicable to the stable and highly stable portion of deposits, from retail customers and SMEs treated like retail customers for the purposes of LCR are pre-defined as part of this assumption. This assumption applies a 95% ASF factor on the stable and highly stable portion of cash flows with cash flow maturity within 1 year and a 100% ASF factor on the stable and highly stable portion of cash flows with cash flow maturity of 1 year or more.	Paragraph 6(c), 7(a), 7(b)
4	MAS ASF-Less stable deposit with maturity less than 1yr	ASF on less stable deposits as defined in the LCR from customers treated as retail with a remaining maturity of less than a year.	The ASF factors applicable to the less stable portion of deposits, from retail customers and SMEs treated like retail customers for the purposes of LCR are pre-defined as part of this assumption. This assumption applies a 90% ASF factor on the stable portion of the retail deposits with maturity of less than 1 year.	Paragraph 6(c), 8(a), 8(b)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
5	MAS ASF-Less stable retail deposits-Cash flow basis	ASF on less stable deposits as defined in the LCR from customers treated as retail with a remaining maturity of more than a year.	The ASF factors applicable to the less stable portion of deposits, from retail customers and SMEs treated like retail customers for the purposes of LCR are pre-defined as part of this assumption. This assumption applies a 90% ASF factor on the less stable portion of cash flows with cash flow maturity within 1 year and a 100% ASF factor on the less stable portion of cash flows with cash flow maturity of 1 year or more.	Paragraph 6(c), 8(a), 8(b)
6	MAS ASF-Unsec funds from nonfin corp with mat less than 1yr	ASF on unsecured funding other than deposits from non-financial corporates with a remaining maturity of less than a year.	The ASF factor to be applied on unsecured borrowings from non-financial corporates. This assumption applies a 50% ASF factor on the EOP balance of borrowings with maturity within 1 year.	Paragraph 6(c), 9(a)
7	MAS ASF-Unsec funds from nonfin corp with mat more than 1yr	ASF on unsecured funding other than deposits from non-financial corporates with a remaining maturity more than a year.	The ASF factor to be applied on unsecured borrowings from non-financial corporates. This assumption applies a 50% ASF factor on the cash flows with cash flow maturity of less than 1 year and a 100% ASF factor on the cash flows with cash flow maturity of 1 year or more.	Paragraph 6(c), 9(a)
8	MAS ASF-Op dep from nonfin corp with maturity less than 1yr	ASF on unsecured operational deposits from non-financial corporates with a remaining maturity of less than a year.	The ASF factor to be applied on unsecured funding from non-financial corporates of which is an operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the operational balance of deposits with maturity within of 1 year.	Paragraph 6(c), 9(a), 9(b)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
9	MAS ASF-Op dep from nonfin corp with maturity more than 1yr	ASF on unsecured operational deposits from non-financial corporates with a remaining maturity of more than a year.	The ASF factor to be applied on unsecured funding from non-financial corporates of which is an operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the operational cash flows with cash flow maturity of 1 year and a 100% ASF factor on the operational cash flows with cash flow maturity of 1 year or more.	Paragraph 6(c), 9(a), 9(b)
10	MAS ASF-Non-op dep from nonfin corp with mat less than 1yr	ASF on unsecured non-operational deposits from non-financial corporates with a remaining maturity of less than a year. This includes entire portion of deposits not classified as operational deposits and non-operational portion of operational deposits.	This assumption specifies unsecured funding from non-financial corporates of which is a non-operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the non-operational balance of deposits with maturity within of 1 year.	Paragraph 6(c), 9(a), 9(b)
11	MAS ASF-Non-op dep from nonfin corp with mat more than 1yr	ASF on unsecured non-operational deposits from non-financial corporates with a remaining maturity of more than a year. This includes entire portion of deposits not classified as	This assumption specifies unsecured funding from non-financial corporates of which is a non-operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the non-operational cash flows with cash flow maturity of 1 year or less and a 100% ASF factor on the non-operational cash flows with cash flow maturity of 1 year or more.	Paragraph 6(c), 9(a), 9(b)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
		operational deposits and non-operational portion of operational deposits		
12	MAS ASF-Unsec funds from central bank with mat less than 1yr	ASF on unsecured funding other than deposits from central bank with a remaining maturity of less than a year.	The ASF factor to be applied on unsecured borrowings from central bank. This assumption applies a 0% ASF factor on the EOP balance of borrowings with maturity period of 6 months and a 50% ASF factor on the EOP balance of borrowings with maturity period within 6 months to less than 1 year.	Paragraph 6(c), 9(b), 9(d), 11(a)
13	MAS ASF-Unsec funds from central bank with mat more than 1yr	ASF on unsecured funding other than deposits from central bank with a remaining maturity of more than a year.	The ASF factor to be applied on unsecured borrowings from central bank. This assumption applies a 0% ASF factor on the cash flows with a cash flow maturity period of 6 months, a 50% ASF factor on the cash flows with cash flow maturity period between 6 month to less than 1 year, and a 100% ASF factor on the cash flows with cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(b), 9(d), 11(a)
14	MAS ASF-Op dep from central bank with maturity less than 1yr	ASF on unsecured operational deposits from central bank with a remaining maturity of less than a year.	The ASF factor to be applied on unsecured funding from central bank of which is an operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the operational balance of deposits with maturity period less than 1 year.	Paragraph 6(c), 9(b), 9(d), 11(a)
15	MAS ASF-Op dep from central bank with maturity more than 1yr	ASF on unsecured operational deposits from central bank with a remaining maturity of more than a year.	The ASF factor to be applied on unsecured funding from central bank of which is an operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the operational cash flows with cash flow maturity of 1 year and a 100% ASF factor on the operational cash flows with a cash flow maturity period of 1	Paragraph 6(c), 9(b), 9(d), 11(a)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
			year or more.	
16	MAS ASF-Non-op dep from central bank with mat less than 1yr	ASF on unsecured non-operational deposits from central bank with a remaining maturity of less than a year. This includes entire portion of deposits not classified as operational deposits and non-operational portion of operational deposits.	This assumption specifies unsecured funding from central banks of which is a non-operational deposit (as defined in the LCR). This assumption applies a 0% ASF factor on the non-operational balances of deposits with a maturity period within of 6 months, and a 50% ASF factor on the non-operational balance of deposits with a maturity period within 6 months to 1 year.	Paragraph 6(c), 9(b), 9(d), 11(a)
17	MAS ASF-Non-op dep from central bank with mat more than 1yr	ASF on unsecured non-operational deposits from central bank with a remaining maturity of more than a year. This includes entire portion of deposits not classified as operational deposits and non-operational portion of operational deposits	This assumption specifies unsecured funding from central bank of which is a non-operational deposit (as defined in the LCR). This assumption applies a 0% ASF factor on the non-operational cash flows with a cash flow maturity period within 6 months, a 50% ASF factor on the non-operational cash flows with cash flow maturity period between 6 months to 1 year, and a 100% ASF factor on the non-operational cash flows with cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(b), 9(d), 11(a)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
18	MAS ASF-Unsec funds from SOV,PSE,MDB with mat less than 1yr	ASF on unsecured funding other than deposits from sovereigns, public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB) with a remaining maturity of less than a year.	The ASF factor to be applied on unsecured borrowings from sovereigns, public sector entity (PSE), multilateral development bank (MDB), national development bank (NDB). This assumption applies a 50% ASF factor on the EOP balance of borrowings with maturity period within 1 year.	Paragraph 6(c), 9(b), 9(c)
19	MAS ASF-Unsec funds from SOV,PSE,MDB with mat more than 1yr	ASF on unsecured funding other than deposits from sovereigns, public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB) with a remaining maturity of more than a year.	The ASF factor to be applied on unsecured borrowings from sovereigns, public sector entity (PSE), multilateral development bank (MDB), national development bank (NDB). This assumption applies a 50% ASF factor on the cash flows with cash flow maturity of less than 1 year and a 100% ASF factor on the cash flows with cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(b), 9(c)
20	MAS ASF-Op deposit from SOV,PSE,MDB with mat less than 1yr	ASF on unsecured operational deposits from sovereigns, public sector entities (PSE), multilateral development	The ASF factor to be applied on unsecured funding from sovereigns, public sector entity (PSE), multilateral development bank (MDB), national development bank (NDB) of which is an operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the operational balance of deposits with maturity	Paragraph 6(c), 9(b), 9(c)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
		banks (MDB) and national development banks (NDB) with a remaining maturity of less than a year.	period within 1 year.	
21	MAS ASF-Op deposit from SOV,PSE,MDB with mat more than 1yr	ASF on unsecured operational deposits from sovereigns, public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB) with a remaining maturity of more than a year.	The ASF factor to be applied on unsecured funding from non-financial corporates of which is an operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the operational cash flows with a cash flow maturity period of less than 1 year, and a 100% ASF factor on the operational cash flows with cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(b), 9(c)
22	MAS ASF-Nonop deposit frm SOV,PSE,MDB with mat less than 1yr	ASF on unsecured non-operational deposits from central bank with a remaining maturity of less than a year. This includes entire portion of deposits not classified as operational deposits and non-operational portion of operational deposits.	This assumption specifies unsecured funding from non-financial corporates of which is a non-operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the Non-operational balance of deposits with maturity within of 1 year.	Paragraph 6(c), 9(b), 9(c)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
23	MAS ASF-Nonop deposit frm SOV,PSE,MDB with mat more than 1yr	ASF on unsecured non-operational deposits from central bank with a remaining maturity of more than a year. This includes entire portion of deposits not classified as operational deposits and non-operational portion of operational deposits.	This assumption specifies unsecured funding from non-financial corporates of which is a non-operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the non-operational cash flows with cash flow maturity period of less than 1 year and a 100% ASF factor on the non-operational cash flows with cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(b), 9(c)
24	MAS ASF-Unsecured funds from fin corp with mat less than 1yr	ASF on unsecured funding other than deposits from financial corporates with a remaining maturity of less than a year.	The ASF factor to be applied on unsecured funding other than deposits from financial corporates. This assumption applies a 0% ASF factor on the EOP balance of borrowings with maturity period within of 6 months and a 50% ASF factor on the EOP balance of borrowings with maturity period within 6 months to less than 1 year.	Paragraph 6(c), 9(b), 9(d), 11(a)
25	MAS ASF-Unsecured funds from fin corp with mat more than 1yr	ASF on unsecured funding other than deposits from financial corporates with a remaining maturity more than a year.	The ASF factor to be applied on unsecured funding other than deposits from financial corporates. This assumption applies a 0% ASF factor on the cash flows with cash flow maturity period within 6 months, a 50% ASF factor on the cash flows with cash flow maturity period of 6 months to less than 1 year, and a 100% ASF factor on the cash flows with cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(b), 9(d), 11(a)
26	MAS ASF-Unsec funds from other	ASF on unsecured funding other than	The ASF factor to be applied on unsecured funding other than deposits from all entities	Paragraph 6(c),

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
	entity with mat less than 1yr	deposits from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national development banks with a remaining maturity of less than a year.	except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national development banks. This assumption applies a 0% ASF factor on the EOP balance of borrowings with maturity period within 6 months and a 50% ASF factor on the EOP balance of borrowings with maturity period between 6 months to less than 1 year.	9(b), 9(d), 11(a)
27	MAS ASF-Unsec funds from other entity with mat more than 1yr	ASF on unsecured funding other than deposits from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national development banks with a remaining maturity of more than a year.	The ASF factor to be applied on unsecured funding other than deposits from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national development banks. This assumption applies a 0% ASF factor on the cash flows with cash flow maturity period within 6 months, a 50% ASF factor on the cash flows with cash flow maturity period between 6 year to less than 1 year, and a 100% ASF factor on the cash flows with cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(b), 9(d), 11(a)
28	MAS ASF-Op deposit from fin corporate with mat less than 1yr	ASF on unsecured operational deposits from financial corporates with a	The ASF factor to be applied on unsecured funding from financial corporates of which is an operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the operational balance of deposits with a maturity	Paragraph 6(c), 9(b), 9(d), 11(a)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
		remaining maturity of less than a year.	period within 1 year.	
29	MAS ASF-Op deposit from other entity with mat less than 1yr	ASF on unsecured operational deposits from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and n with a remaining maturity of less than a year.	The ASF factor to be applied on unsecured funding from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national development banks of which is an operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the operational balance of deposits with maturity period within 1 year.	Paragraph 6(c), 9(b), 9(d), 11(a)
30	MAS ASF-Op deposit from fin corporate with mat more than 1yr	ASF on unsecured operational deposits from financial corporates with a remaining maturity of more than a year.	The ASF factor to be applied on unsecured funding from financial corporates of which is an operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the operational cash flows with cash flow maturity period of less than 1 year and a 100% ASF factor on the operational cash flows with a cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(b), 9(d), 11(a)
31	MAS ASF-Op deposit from other entity with mat more than 1yr	ASF on unsecured operational deposits from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development	The ASF factor to be applied on unsecured funding from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national development banks of which is an operational deposit (as defined in the LCR). This assumption applies a 50% ASF factor on the operational cash flows with cash flow maturity period of less than 1 year and a 100% ASF factor on the operational cash flows with cash flow maturity period of 1 year	Paragraph 6(c), 9(b), 9(d), 11(a)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
		banks and n with a remaining maturity of less than a year.	or more.	
32	MAS ASF-Nonop deposit from fin corp with mat less than 1yr	ASF on unsecured non-operational deposits from financial corporates with a remaining maturity of less than a year. This includes entire portion of deposits not classified as operational deposits and non-operational portion of operational deposits.	This assumption specifies unsecured funding from financial corporates of which is a non-operational deposit (as defined in the LCR). This assumption applies a 0% ASF factor on the non-operational balance of deposits with maturity period within 6 months and a 50% ASF factor on the non-operational balance of deposits with maturity period between 6 months to less than 1 year.	Paragraph 6(c), 9(b), 9(d), 11(a)
33	MAS ASF-Nonop deposit from fin corp with mat more than 1yr	ASF on unsecured non-operational deposits from financial corporates with a remaining maturity of more than a year. This includes entire portion of deposits not classified as operational deposits and non-operational portion of operational deposits.	This assumption specifies unsecured funding from financial corporates of which is a non-operational deposit (as defined in the LCR). This assumption applies a 0% ASF factor on the non-operational cash flows with a cash flow maturity period within 6 months, a 50% ASF factor on the non-operational cash flows with a cash flow maturity period between 6 months to less than 1 year and a 100% ASF factor on the non-operational cash flows with cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(b), 9(d), 11(a)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
34	MAS ASF-Nonop dep from other entity with mat less than 1yr	ASF on unsecured non-operational deposits from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national development banks with a remaining maturity of less than a year. This includes entire portion of deposits not classified as operational deposits and non-operational portion of operational deposits.	This assumption specifies unsecured funding from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national development banks of which is a non-operational deposit (as defined in the LCR). This assumption applies a 0% ASF factor on the non-operational balance of deposits with maturity period within 6 months and a 50% ASF factor on the non-operational balance of deposits with maturity period between 6 months to less than 1 year.	Paragraph 6(c), 9(b), 9(d), 11(a)
35	MAS ASF-Nonop dep from other entity with mat more than 1yr	ASF on unsecured non-operational deposits from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national	This assumption specifies unsecured funding from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national development banks of which is a non-operational deposit (as defined in the LCR). This assumption applies a 0% ASF factor on the non-operational cash flows with cash flow maturity period within 6 months, a 50% ASF factor on the non-operational cash flows with cash flow maturity period between 6 months to less than 1 year and a 100% ASF factor on the	Paragraph 6(c), 9(b), 9(d), 11(a)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
		development banks with a remaining maturity of more than a year. This includes entire portion of deposits not classified as operational deposits and non-operational portion of operational deposits.	non-operational cash flows with a cash flow maturity period of 1 year or more.	
36	MAS ASF:Co-op bank network deposits with mat less than 1yr	ASF on deposits from members of the same cooperative network of banks subject to national discretion with a remaining maturity of less than 1 year	This assumption specifies the deposits between banks within the same cooperative network. This assumption applies a 0% ASF factor on the EOP balance of deposits with maturity within 6 months and a 50% ASF factor on the EOP balance of deposits with maturity between 6 months to less than 1 year.	Paragraph 6(c), 9(d), 11(a), 15
37	MAS ASF:Co-op bank network deposits with mat more than 1yr	ASF on deposits from members of the same cooperative network of banks subject to national discretion with a remaining maturity of more than 1 year	This assumption specifies the deposits between banks within the same cooperative network. This assumption applies a 0% ASF factor on the cash flows with cash flow maturity between within 6 months, a 50% ASF factor on the cash flows with cash flow maturity between 6 months to less than 1 year and a 100% ASF factor on the cash flows with cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(d), 11(a), 15

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
38	MAS ASF-Secured funding from retail with mat less than 1yr	ASF on secured funding from customers which are treated as retail with a remaining maturity of less than a year.	This assumption specifies the secured funding from customers which are treated as retail. This assumption applies a 0% ASF factor on the EOP balance of borrowings with maturity within 6 months and a 50% ASF factor on the EOP balance of borrowings with a maturity period between 6 month to less than 1 year.	Paragraph 6(c), 9(a), 9(c), 9(d), 11(a)
39	MAS ASF-Secured funding from retail with mat more than 1yr	ASF on secured funding from customers which are treated as retail with a remaining maturity of more than a year.	This assumption specifies the secured deposits from customers which are treated as retail. This assumption applies a 0% ASF factor on the cash flows with cash flow maturity period within 6 months, a 50% ASF factor on the cash flows with cash flow maturity period of 6 month to less than 1 year and a 100% ASF factor on the cash flows with cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(a), 9(c), 9(d), 11(a)
40	MAS ASF-Secured fund from nonfin corp with mat less than 1yr	ASF on secured funding from financial and non-financial corporates with a remaining maturity of less than a year	This assumption specifies the secured funding from non-financial corporates. This assumption applies a 50% ASF factor on the EOP balance of borrowings with maturity period within 1 year.	Paragraph 6(c), 9(a), 9(c), 9(d), 11(a)
41	MAS ASF-Secured funding from fin corp with mat less than 1yr	ASF on secured funding from financial and non-financial corporates with a remaining maturity of less than a year	This assumption specifies the secured funding from financial corporates. This assumption applies a 0% ASF factor on the EOP balance of borrowings with maturity period within 6 months and a 50% ASF factor on the EOP balance of borrowings with maturity period between 6 months to less than 1 year.	Paragraph 6(c), 9(a), 9(c), 9(d), 11(a)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
42	MAS-ASF-Secured fund from nonfin corp with mat more than 1yr	ASF on secured funding from financial and non-financial corporates with residual a remaining maturity of more than a year	This assumption specifies the secured funding from non-financial corporates. This assumption applies a 50% ASF factor on the cash flows with a cash flow maturity period of less than 1 year and a 100% ASF factor on the cash flows with cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(a), 9(c), 9(d), 11(a)
43	MAS-ASF-Secured funding from fin corp with mat more than 1yr	ASF on secured funding from financial and non-financial corporates with residual a remaining maturity of more than a year	This assumption specifies the secured funding from financial corporates. This assumption applies a 0% ASF factor on the cash flows with a cash flow maturity period within 6 months, a 50% ASF factor on the cash flows with a cash flow maturity period between 6 months to less than 1 year and a 100% ASF factor on the cash flows with a cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(a), 9(c), 9(d), 11(a)
44	MAS-ASF-Sec funding from central bank with mat less than 1yr	ASF on secured funding from central banks with a remaining maturity of less than a year	This assumption specifies the secured funding from central banks. This assumption applies a 0% ASF factor on the EOP balance of borrowings with a maturity period within of 6 months and a 50% ASF factor on the EOP balance of borrowings with a maturity period between 6 months to less than 1 year.	Paragraph 6(c), 9(a), 9(c), 9(d), 11(a)
45	MAS-ASF-Sec funding from central bank with mat more than 1yr	ASF on secured funding from central banks with a remaining maturity of more than a year	This assumption specifies the secured funding from central banks. This assumption applies a 0% ASF factor on the cash flows with cash flow maturity period within 6 months, a 50% ASF factor on the cash flows with cash flow maturity period between 6 months to less than 1 year and a 100% ASF factor on the cash flows with a cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(a), 9(c), 9(d), 11(a)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
46	MAS-ASF-Secured fund from SOV,PSE,MDB with mat less than 1yr	ASF on secured funding from sovereigns, public sector entities, multilateral development banks and national development banks with a residual maturity of less than a year	This assumption specifies the secured funding from sovereigns, public sector entities, multilateral development banks and national development banks. This assumption applies a 50% ASF factor on the EOP balance of fundings with a maturity period within 1 year.	6(c), 9(a), 9(c), 9(d), 11(a)
47	MAS-ASF-Secured fund from SOV,PSE,MDB with mat more than 1yr	ASF on secured funding from sovereigns, public sector entities, multilateral development banks and national development banks with a residual maturity of more than a year	This assumption specifies the secured funding from sovereigns, public sector entities, multilateral development banks and national development banks. This assumption applies a 50% ASF factor on the cash flows with cash flow maturity period of less than 1 year and a 100% ASF factor on the cash flows with a cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(a), 9(c), 9(d), 11(a)
48	MAS-ASF-Secured fund frm other entity with mat less than 1yr	ASF on secured funding from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national development banks with a	This assumption specifies the secured funding from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national development banks. This assumption applies a 50% ASF factor on the EOP balance of borrowings with maturity period within 1 year.	Paragraph 6(c), 9(a), 9(c), 9(d), 11(a)

Sl. No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
		residual maturity of less than a year		
49	MAS-ASF-Secured fund frm other entity with mat more than 1yr	ASF on secured funding from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national development banks with a residual maturity of more than a year	This assumption specifies the secured funding from all entities except retail, corporates, central banks, sovereigns, public sector entities, multilateral development banks and national development banks. This assumption applies a 0% ASF factor on the cash flows with cash flow maturity period within 6 months, a 50% ASF factor on the cash flows with a cash flow maturity period between 6 months to less than 1 year and a 100% ASF factor on the cash flows with cash flow maturity period of 1 year or more.	Paragraph 6(c), 9(a), 9(c), 9(d), 11(a)
50	MAS ASF-Trade date payables	ASF on trade date payables arising from purchases of foreign currencies, financial instruments and commodities that are expected to settle or have failed but are expected to settle within the standard settlement cycle.	The ASF factor applicable to trade payable cash flows arising from purchases of foreign currencies, financial instruments and commodities expected to settle within the standard settlement cycle, are pre-defined in this assumption. This assumption applies a 0% ASF factor on the trade payable cash flows.	Paragraph 11(d)
51	MAS ASF-Liabilities with open maturity	ASF on deposits and all other borrowings which do not have a stated maturity.	The ASF factor applicable to all the other fundings without any stated maturity are pre-defined in this assumption. This assumption applies 0% ASF factor on all the fundings without any maturity.	Paragraph 11(b)

3.3.1.2 Required Stable Funding Factor

This section enlists all the pre seeded assumptions acting on assets and off balance sheet items which receive an RSF factor.

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
1	MAS-RSF-Coins and banknotes	RSF on coins, banknotes, cash and restricted cash held by the bank.	The RSF factor applicable to coins, banknotes, and cash held by the bank, is pre-defined as a part of this assumption. This assumption applies 0% RSF factor on the coins, banknotes, and cash held by bank.	Paragraph 32(a)
2	MAS-RSF-Central bank reserves	RSF on all central bank reserves, including, required reserves and excess reserves.	The RSF factors applicable to required and excess central bank reserves, are pre-defined as a part of this assumption. This assumption applies a 0% RSF factor to all central bank reserves.	Paragraph 32(b)
3	MAS-RSF- Unencumbered claims on central banks	RSF on unencumbered loans and other claims on central banks	The RSF factors applicable to unencumbered loans, debt security and claims on central banks, are pre-defined as part of this assumption. This assumption applies 0%, 50% and 100% RSF factors to the loans, debt security and claims on central banks with remaining maturity period of less than 6 months, between 6 months	Paragraphs 25, 32(c), 36(c), 40(a)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
			and 1 year, and 1 year or more respectively.	
4	MAS-RSF- Encumbered claims on central banks	RSF on encumbered loans and other claims on central banks	The RSF factors applicable to encumbered loans, debt security and claims on central banks, are pre-defined as part of this assumption. For the qualifying assets with encumbrance period of less than 6 months, the assumption applies 0%, 50%, and 100% RSF factors based on a remaining maturity of less than 6 months, between 6 months and 1 year, and 1 year or more respectively. For assets with encumbrance period of between 6 months and 1 year, the assumption applies 50%, and 100% RSF factors based on a remaining maturity of less than 1 year and 1 year or more respectively. A 100% RSF factor is applied to all assets maturing within a year and encumbrance period of 1 year or more.	Paragraphs 25, 32(c), 36(c), 40(a)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
5	MAS-RSF-Unencumbered loans to fin entity backed by level 1 asset	RSF on unencumbered loans to financial institutions where the loan is secured against Level 1 assets as defined in the LCR.	The RSF factors applicable on the unencumbered loans and overdrafts given to financial institutions secured by a level 1 asset, are pre-defined as a part of this assumption. The assumption applies RSF factor of 10%,50%,100% on the unencumbered secured loans given to financial institutions secured by level 1 asset with remaining maturity of less than 6 months, 6 months to 1 year and 1 year or more respectively, where the collateral received can be re-hypothecated for the life of loan. The assumption applies RSF factor of 15%,50%,100% on the unencumbered secured loans given to financial institutions secured by level 1 asset with remaining maturity of less than 6 months, 6 months to 1 year and 1 year or more respectively, where the collateral received cannot be re-hypothecated for the life of loan.	Paragraphs 25, 34, 35(b), 36(c), 40(a), 40(c)
6	MAS-RSF-Encumbered loans to fin entity backed by level 1	RSF on encumbered loans to financial institutions	The RSF factors applicable on the loans and overdrafts	Paragraphs 25, 34, 35(b), 36(c), 40(a),

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
	asset	where the loan is secured against Level 1 assets as defined in the LCR.	given to financial institutions secured by a level 1 asset, are pre-defined as a part of this assumption. The assumption applies relevant RSF factors on the encumbered secured loans based on the residual maturity and encumbrance period of the loan.	Paragraph 40(c)
7	MAS-RSF-Unencum loans to fin entity backed by non-level 1 asset	RSF on unencumbered loans to financial institutions where the loan is secured against assets belonging to levels other than level 1, as defined in the LCR.	The RSF factors applicable on the unencumbered loans given to financial institutions secured by assets belonging to levels other than level 1, with residual maturity less than 1 year, are pre-defined as a part of this assumption. The assumption applies RSF factor of 15%, 50%,100% on the unencumbered secured loans given to financial institutions secured by assets belonging to levels other than level 1 with remaining maturity of less than 6 months, 6 months to 1 year and 1 year or more respectively.	Paragraphs 25, 34, 35(b), 36(c), 40(a), 40(c)
8	MAS-RSF-Encumbered loan to fin entity backed by non-level1 asset	RSF on encumbered loans to financial institutions where the loan is secured against assets belonging to levels other than level 1, as	The RSF factors applicable on the encumbered loans given to financial institutions secured by assets belonging to levels other than level 1,	

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
		defined in the LCR.	are pre-defined as a part of this assumption. The assumption applies relevant RSF factor on the encumbered secured loans based on the residual maturity and encumbrance period of the loan.	
9	MAS-RSF-Unencumbered unsecured loans to financial entities	RSF on unencumbered unsecured loans to financial institutions.	The RSF factors applicable on the unencumbered unsecured loans given to financial institutions, are pre-defined as a part of this assumption. The assumption applies RSF factor of 15%, 50%, and 100% on the unencumbered unsecured loans given to financial institutions, with remaining maturity of less than 6 months, 6 months to 1 year and 1 year or more respectively.	Paragraphs 25, 35(b), 36(c), 40(a), 40(c)
10	MAS-RSF-Encumbered unsecured loans to financial entities	RSF on encumbered unsecured loans to financial institutions.	The RSF factors applicable on the encumbered unsecured loans given to financial institutions, are pre-defined as a part of this assumption. The assumption applies relevant RSF factor on the encumbered secured loans given to financial institutions based on the residual maturity and encumbrance	Paragraphs 25, 35(b), 36(c), 40(a), 40(c)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
			period of the loan.	
11	MAS-RSF-Unencumbered level 1 assets	RSF on unencumbered assets which qualify for inclusion in Level 1 of High quality liquid assets as defined in the LCR.	The RSF factors applicable to unencumbered assets, which qualify for inclusion in Level 1 of High quality liquid assets as defined in the LCR, are pre-defined as a part of this assumption. The assumption applies a 5% RSF factor on the unencumbered Level 1 assets.	Paragraphs 25, 33, 36(b), 40(a)
12	MAS-RSF-Unencumbered level 2A assets	RSF on unencumbered assets which qualify for inclusion in Level 1 of High quality liquid assets as defined in the LCR.	The RSF factors applicable to unencumbered assets, which qualify for inclusion in Level 2A, and 2B of High quality liquid assets as defined in the LCR, are pre-defined as a part of this assumption. The assumption applies a 15% RSF factor on the unencumbered Level 2A assets.	Paragraphs 25, 35(a), 36(b), 40(a)
13	MAS-RSF-Unencumbered level 2B assets	RSF on unencumbered assets which qualify for inclusion in Level 1 of High quality liquid assets as defined in the LCR.	The RSF factors applicable to unencumbered assets, which qualify for inclusion in Level 2A, and 2B of High quality liquid assets as defined in the LCR, are pre-defined as a part of this assumption. The assumption applies a RSF factor of 50% on the unencumbered Level 2B	Paragraphs 25, 36(a), 36(b), 40(a)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
			assets	
14	MAS-RSF- Encumbered level 2B assets	RSF on encumbered portion of assets which qualify for inclusion in Level 2B of High quality liquid assets as defined in the LCR.	The RSF factors applicable to encumbered portion of assets, which qualify for inclusion in Level 2B of High quality liquid assets as defined in the LCR, are pre-defined as a part of this assumption. The assumption applies 50% and 100% RSF factors on the encumbered portion of Level 2B assets, with encumbrance period of less than 1 year and 1 year or more respectively.	Paragraphs 25, 36(a), 36(b), 40(a)
15	MAS-RSF-Encumbered level 1 assets	RSF on encumbered portion of assets which qualify for inclusion in Level 1 of High quality liquid assets as defined in the LCR.	The RSF factors applicable to encumbered portion of assets, which qualify for inclusion in Level 1 of High quality liquid assets as, defined in the LCR, are pre-defined as a part of this assumption. The assumption applies 5%,50% and 100% RSF factors on the encumbered portion of Level 1 assets, with encumbrance period of less than 6 months, between 6 months to 1 year and 1 year or more respectively.	Paragraphs 25, 33, 36(b), 40(a)
16	MAS-RSF- Encumbered level 2A assets	RSF on encumbered portion of assets which qualify for inclusion in	The RSF factors applicable to encumbered portion of assets, which qualify for	Paragraphs 25, 35(a), 36(b), 40(a)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
		Level 2A of High quality liquid assets as defined in the LCR.	inclusion in Level 2A of High quality liquid assets as defined in the LCR, are pre-defined as a part of this assumption. The assumption applies 15%, 50% and 100% RSF factors on the encumbered portion of Level 2A assets, with encumbrance period of less than 6 months, between 6 months to 1 year and 1 year or more respectively.	
17	MAS-RSF-Unencumbered operational deposits with financial entity	RSF on operational portion of Unencumbered deposits held at other financial institutions, for operational purpose and are subject to the 50% ASF treatment.	The RSF factors applicable to operational portion of unencumbered deposits held at other financial institutions to fulfil the operational requirements, are pre-defined as part of this assumption. The assumption applies RSF factor of 50% and 100% on operational portion of unencumbered deposits held at other financial institutions, with remaining maturity of less than 1 year and 1 year or more respectively.	Paragraphs 25, 36(d), 40(a)
18	MAS-RSF-Unencumbered non-operational deposit with fin entity	RSF on non-operational portion of Unencumbered deposits held at other financial institutions, for operational purpose and	The RSF factors applicable to non-operational portion of unencumbered deposits held at other financial institutions, are pre-defined	Paragraphs 25, 36(d), 40(a)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
		are subject to the 50% ASF treatment.	as part of this assumption. The assumption applies RSF factor of 15%, 50% and 100% on non-operational portion of unencumbered deposits held at other financial institutions, with remaining maturity of less than 6 months, between 6 months to 1 year and 1 year or more respectively.	
19	MAS-RSF-Encumbered deposits with financail entity	RSF on encumbered deposits, held at other financial institutions, for operational purpose and are subject to the 50% ASF treatment.	The RSF factors applicable to operational portion of encumbered deposits held at other financial institutions, are pre-defined as part of this assumption. The assumption applies RSF factor of 50% and 100% on operational portion of unencumbered deposits held at other financial institutions, with remaining maturity of less than 1 year and 1 year or more respectively.	Paragraphs 25, 36(d), 40(a)
20	MAS-RSF- Trade date receivables	RSF on trade date receivables arising from purchases of foreign currencies, financial instruments and commodities that are expected to settle or have failed but are expected to settle within the standard	The RSF factor applicable to trade date receivables arising from sell of foreign currencies, money market instruments and commodities that are expected to settle or have failed but are expected to settle within the standard	Paragraph 32(d)

Serial No.	**Assumption Name**	**Assumption Description**	**Regulatory Requirement Addressed**	**Regulatory Reference : MAS Notice 652**
		settlement cycle.	settlement cycle, are pre-defined as part of this assumption. The assumption applies 0% RSF factor on cash flows of trade receivables, which are expected to settle within settlement cycle.	
21	MAS-RSF-Unencumbered residential mortgage loans	RSF on unencumbered residential mortgage loans which would qualify for a) 35% or lesser risk weight as per Basel 2 standardised approach for credit risk b) higher than 35% risk weight as per Basel 2 standardised approach for credit risk	The RSF factors applicable to unencumbered residential mortgage loans, with standardized risk weights under Basel 2 approach, are per defined as part of this assumption. The assumption applies RSF factors of 50% and 65% on the unencumbered residential mortgage loans, with remaining maturity of less than 1 year and 1 year or more respectively, with risk weights less than or equal to 35%. It applies RSF factors of 50% and 85% on the unencumbered residential mortgage loans, with remaining maturity of less than 1 year and 1 year or more respectively, with risk weights greater than 35%.	Paragraphs 25, 36(e), 37(a), 40(a)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
22	MAS-RSF-Encumbered residential mortgage loans	RSF on encumbered residential mortgage loans which would qualify for a) 35% or lesser risk weight as per Basel 2 standardised approach for credit risk b) higher than 35% risk weight as per Basel 2 standardised approach for credit risk	The RSF factors applicable to encumbered residential mortgage loans, with standardized risk weights under Basel 2 approach, are per defined as part of this assumption. The assumption applies relevant RSF factor on the encumbered residential mortgage loans based on the residual maturity and encumbrance period of the loan.	Paragraphs 25, 36(e), 37(a), 40(a)
23	MAS-RSF-Deposits placed within same co-operative network	RSF on deposits between banks within the same co operative network, placed as required by law or in the context of common task sharing and legal, statutory, or contractual arrangements.	This assumption specifies the deposits between banks within the same cooperative network. This assumption applies a 15% RSF factor on the EOP carrying value of deposits with maturity within of 6 months, a 50% RSF factor on the EOP carrying value of deposits with maturity within of 6 months to less than 1 year and a 100% RSF factor on the EOP carrying value of deposits with maturity of 1 year or more.	Paragraphs 15, 25, 35(b), 36(c), 40(a), 40(c)
24	MAS-RSF-Unencumbered other deposits from co-operative network	RSF on unencumbered other deposits from co operative banks.	This assumption specifies the other unencumbered deposits from cooperative banks. This assumption applies a 15% RSF factor	Paragraphs 15, 25, 35(b), 36(c), 40(a), 40(c)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
			on the Unencumbered balance of other deposits by cooperative banks with maturity within of 6 months, a 50% RSF factor on the Unencumbered balance of deposits with maturity within of 6 months to less than 1 year and a 100% RSF factor on the Unencumbered balance of deposits with maturity of 1 year or more.	
25	MAS-RSF-Encumbered other deposits from co-operative network	RSF on encumbered other deposits from Co operative banks	This assumption specifies the other encumbered deposits from cooperative banks. This assumption applies a 15% RSF factor on the Encumbered carrying value of other deposits by cooperative banks with maturity within of 6 months, a 50% RSF factor on the Encumbered carrying value of deposits with maturity within of 6 months to less than 1 year and a 100% RSF factor on the Encumbered carrying value of deposits with maturity of 1 year or more.	Paragraphs 15, 25, 35(b), 36(c), 40(a), 40(c)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
26	MAS-RSF-Unenc loan to non-fin corp,SOV,PSE,MDB mat less than 1yr	RSF on encumbered loans with residual maturity of less than a year to non financial corporates, retail customers, sovereigns(SOV), public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB).	The RSF factors applicable on the unencumbered loans given to non financial corporates, retail customers, sovereigns(SOV), public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB), with residual maturity less than 1 year, are pre-defined as a part of this assumption. The assumption applies RSF factor of 50% on the unencumbered carrying value.	Paragraphs 25, 36(e), 40(a)
27	MAS-RSF-Encumumbered loan to non-fin corporate,sovereign,PSE,MDB	RSF on encumbered loans to non-financial corporates, retail customers, sovereigns, public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB).	The RSF factors applicable on the encumbered loans given to non financial corporates, retail customers, sovereigns(SOV), public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB), with residual maturity less than 1 year, are pre-defined as a part of this assumption. The assumption applies 50% and 100% RSF factors on the encumbered carrying value, with encumbrance period of less than 1 year and 1 year or more respectively.	Paragraphs 25, 36(e), 40(a)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
28	MAS-RSF-Other unencumbered loan to non-fin corporate,SOV,PSE,MDB	RSF on other unencumbered loans having Basel risk weight of more than 35 % with any maturity or having Basel risk weight of less than 35 % but residual maturity of more than a year to non-financial corporates, retail customers, sovereigns(SOV), public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB).	The RSF factors applicable to unencumbered fully performing loans to non-financial corporates, retail customers, sovereigns(SOV), public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB), with standardized risk weights under Basel 2 approach, are per defined as part of this assumption. The assumption applies RSF factors of 65% on the unencumbered carrying value, with remaining maturity of 1 year or more having risk weights less than or equal to 35%. It applies RSF factors of 50% and 85% on the unencumbered carrying value, with remaining maturity of less than 1 year and 1 year or more respectively, with risk weights greater than 35%.	Paragraphs 25, 37(b), 36(e), 38(b), 40(a)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
29	MAS-RSF-Other encumbered loans to non-fin corporate,SOV,PSE,MDB	RSF on other encumbered loans having Basel risk weight of more than 35 % with any maturity or having Basel risk weight of less than 35 % but residual maturity of more than a year to non-financial corporates, retail customers, sovereigns(SOV), public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB).	The RSF factors applicable to encumbered fully performing loans to non-financial corporates, retail customers, sovereigns(SOV), public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB), with standardized risk weights under Basel 2 approach, are per defined as part of this assumption. The assumption applies relevant RSF factor on the encumbered carrying value based on the residual maturity and encumbrance period of the loan.	Paragraphs 25, 37(b), 36(e), 38(b), 40(a)
30	MAS-RSF-Other unencumbered loan to other entities	RSF on other unencumbered loans with residual maturity of less than a year to all entities other than banks, central banks, corporates, retail customers, sovereigns(SOV), public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB).	The RSF factors applicable on the unencumbered loans given to all entities other than banks, central banks, corporates, retail customers, sovereigns(SOV), public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB), with residual maturity less than 1 year, are pre-defined as a part of this assumption. The assumption applies RSF factor of 50% on the	Paragraphs 25, 36(e), 40(a)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
			unencumbered carrying value.	
31	MAS-RSF-Other encumbered loan to other entities	RSF on other encumbered loans to all entities other than banks, central banks, corporates, retail customers, sovereigns(SOV), public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB).	The RSF factors applicable on the encumbered loans given all entities other than banks, central banks, corporates, retail customers, sovereigns(SOV), public sector entities (PSE), multilateral development banks (MDB) and national development banks (NDB), are pre-defined as a part of this assumption. The assumption applies 50% and 100% RSF factors on the encumbered carrying value, with encumbrance period of less than 1 year and 1 year or more respectively.	Paragraphs 25, 36(e), 40(a)
32	MAS-RSF-Unencumbered non-HQLA securities maturity less than 1yr	RSF on unencumbered securities, with maturity less than 1 year, which do not qualify as high quality liquid assets under the liquidity coverage ratio (LCR) rule.	The RSF factors applicable to unencumbered securities, with remaining maturity of less than 1 year and which do not qualify, as High quality liquid assets under the LCR Rule, are pre-defined as part of this assumption. The assumption applies a 50% RSF factor on unencumbered securities, which do not qualify as High quality liquid assets under	Paragraphs 25, 36(e), 38(c), 40(a)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
			the LCR Rule, with remaining maturity of less than 1 year	
33	MAS-RSF-Unencumbered non-HQLA securities maturity more than 1yr	RSF on unencumbered securities which are not in default, with maturity greater than 1 year that do not qualify as high quality liquid assets under the liquidity coverage ratio (LCR) rule.	The RSF factors applicable to unencumbered securities that are not in default, with remaining maturity of more than 1 year and which do not qualify as High quality liquid assets under the LCR Rule , are pre-defined as part of this assumption. The assumption applies a 85% RSF factor on unencumbered securities, with remaining maturity of more than 1 year and which do not qualify as High quality liquid assets under the LCR Rule.	Paragraphs 25, 36(e), 38(c), 40(a)
34	MAS-RSF-Encumbered non-HQLA securities maturity less than 1yr	RSF on encumbered portion of securities, with maturity less than 1 year that do not qualify as high quality liquid assets under the liquidity coverage ratio (LCR) rule.	The RSF factors applicable to encumbered portion of the securities, with remaining maturity of less than 1 year and which do not qualify as High quality liquid assets under the LCR Rule , are pre-defined as part of this assumption. The assumption applies 50% and 100% RSF factors on the encumbered portion of the securities, with encumbrance period of less than 1 year and 1 year or	Paragraphs 25, 36(e), 38(c), 40(a)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
			more respectively which do not qualify as High quality liquid assets under the LCR Rule.	
35	MAS-RSF-Encumbered non-HQLA securities maturity more than 1yr	RSF on encumbered portion of securities which are not in default, with maturity greater than 1 year that do not qualify as high quality liquid assets under the liquidity coverage ratio (LCR) rule.	The RSF factors applicable to encumbered portion of the securities that are not in default, with remaining maturity of more than 1 year and which do not qualify as High quality liquid assets under the LCR Rule, are pre defined as part of this assumption. The assumption applies 80% and 100% RSF factors on the encumbered portion of the securities, with encumbrance period of less than 1 year and 1 year or more respectively which do not qualify as High quality liquid assets under the LCR Rule.	Paragraphs 25, 36(e), 38(c), 40(a)
36	MAS-RSF-Encumbered non-HQLA exchange traded equities	RSF on encumbered exchange traded equities, that do not qualify as high quality liquid assets under the liquidity coverage ratio (LCR) rule.	The RSF factors applicable to encumbered exchange traded equities that are settled and do not qualify as High quality liquid assets under the LCR Rule, are pre-defined as part of this assumption. The assumption applies 85% and 100% RSF factors on the encumbered carrying	Paragraphs 25, 38(c), 40(a)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
			value of the securities, with encumbrance period of less than 1 year and 1 year or more respectively which do not qualify as High quality liquid assets under the LCR Rule.	
37	MAS-RSF-Unencumbered non-HQLA exchange traded equities	RSF on unencumbered exchange traded equities, that do not qualify as high quality liquid assets under the liquidity coverage ratio (LCR) rule.	The RSF factors applicable to unencumbered exchange traded equities that are settled and do not qualify as High quality liquid assets under the LCR Rule, are pre-defined as part of this assumption. The assumption applies a 85% RSF factor on unencumbered carrying value.	Paragraphs 25, 38(c), 40(a)
38	MAS-RSF-Unencumbered commodities	RSF on unencumbered physically traded commodities, including gold.	The RSF factors applicable to unencumbered physically traded commodities, including gold, are pre-defined as part of this assumption. The assumption applies a 85% RSF factor on the unencumbered carrying value of the commodities.	Paragraphs 25, 38(d), 40(a)
39	MAS-RSF-Encumbered commodities	RSF on encumbered physically traded commodities including gold.	The RSF factors applicable to encumbered physically traded commodities, including gold, are pre-defined as part of this assumption. The	Paragraphs 25, 38(d), 40(a)

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
			assumption applies 85% and 100% RSF factors on the encumbered carrying value of the commodities, with encumbrance period of less than 1 year and 1 year or more respectively.	
40	MAS-RSF-Non performing loans	RSF on non-performing loans.	The RSF factors applicable to non-performing loans, are pre-defined as part of this assumption. The assumption applies a 100% RSF factor on the EOP carrying value of the non-performing loans.	Paragraph 40(c)
41	MAS-RSF-Defaulted securities	RSF on securities that are in default.	The RSF factors applicable to securities that are in default, are pre-defined as part of this assumption. The assumption applies a 100% RSF factor on the EOP carrying value of the defaulted securities.	Paragraph 40(c)

3.3.1.3 Derivatives

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
1	MAS-ASF-Net NSFR derivative liabilities	ASF on derivative liabilities net of derivative assets, where derivative liability is net of any variation margin posted and derivative asset is net of cash margin received	The ASF factor applicable to all derivative contracts including netted derivative contracts, where the net aggregate mark to market value of the contracts for an entity including any variation margin adjustment is negative, is pre-defined as part of this assumption. The assumption applies a 0% ASF factor to the derivative liabilities net of derivative assets, where the net aggregate mark to market value of the contracts is negative.	Paragraphs 11(c), 16, 17, FN 13

2	MAS-RSF-Net NSFR derivative assets	RSF on derivative assets net of derivative liabilities, where derivative liability is net of any variation margin posted and derivative asset is net of cash margin received	The RSF factor applicable to all derivative contracts including netted derivative contracts, where the net aggregate mark to market value of the contracts for an entity including any cash margin adjustment is positive, is pre-defined as part of this assumption. The assumption applies a 100% RSF factor to the derivative assets net of derivative liabilities, where the net aggregate mark to market value of the contracts is positive.	Paragraphs 29, 30, 31, FN 19, 40(b)
3	MAS-RSF-Default fund contribution to CCP for derivatives	RSF treatment of default fund contributed to central counterparty for derivative transactions	The RSF factor applicable to all derivative contracts for default fund contribution to central counterparty, is pre-defined as part of this assumption. The assumption applies a 85% RSF factor to the market value of collateral posted.	Paragraphs 38(a)

4	MAS-RSF-Derivative liability portion inclusion as RSF	Additional 20% portion of derivative liabilities to be included as part of RSF	The RSF factor applicable to all derivative contracts including netted derivative contracts, where the aggregate mark to market value of the contracts prior to any variation margin adjustment is negative, is pre-defined as part of this assumption. The assumption applies a 0% RSF factor to the 20% of negative mark-to-mark value for the aforementioned derivative contracts.	Paragraphs 40(d)
5	MAS-RSF-Initial margin posted for derivatives	RSF treatment of initial margin posted against derivative transactions	The RSF factor applicable to the initial margin posted for the derivative contracts is pre-defined as part of this assumption. The assumption applies a 85% RSF factor to the initial margin posted against the derivative contracts.	Paragraphs 38(a)

3.3.1.4 Off-Balance Sheet Items

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
1	MAS-RSF-Credit and liquidity facilities to client	Off balance sheet exposures- Irrevocable, revocable and conditionally revocable credit and liquidity facilities offered to any clients by the bank	The RSF factor applicable to irrevocable, revocable and conditionally revocable credit and liquidity facilities offered to any clients by the bank, is pre-defined as part of this assumption. The assumption applies a 5% RSF factor to the undrawn amount of irrevocable and conditionally revocable credit and liquidity facilities and RSF factor of 2% in case of revocable credit and liquidity facilities.	Paragraph 43
2	MAS-RSF-Guarantees and letters of credit	Off balance sheet exposures- Guarantees and letters of credit	The RSF factor applicable to the Guarantees and Letters of credit offered by the bank, is pre-defined as part of this assumption. The assumption applies a 0% RSF factor to the EOP carrying value.	Paragraph 43
3	MAS-RSF-Non contractual obligations type	Non contractual obligations type such as potential requests for debt repurchases, managed funds etc	The RSF factor applicable to the non-contractual obligations type such as managed funds and debt buy back, is pre-defined as part of this assumption. The assumption applies 0% RSF factor to the aforesaid non-contractual obligations amount.	Paragraph 43
4	MAS-RSF-Non contractual obligations	MAS: Non contractual obligations type such as potential requests for debt repurchases, managed funds etc	The RSF factor applicable to the non-contractual obligations for structured products such as Variable rate notes (VRDNs), Adjustable rate notes (ARDNs) and	Paragraph 43

Serial No.	Assumption Name	Assumption Description	Regulatory Requirement Addressed	Regulatory Reference : MAS Notice 652
			so on, offered by the bank, is pre-defined as part of this assumption. The assumption applies a 0% RSF factor to the EOP balance for aforesaid non-contractual obligations.	

4 Minimum Liquid Assets Calculation

4.1 Overview

Minimum Liquid Asset addresses the liquidity needs of a bank or financial institution that are neither headquartered in Singapore, nor are domestic systematically important banks.

4.2 Process Flow

- Identification and Treatment of Qualifying Liabilities
- Identification of Liquid Assets
- Calculation of Minimum Assets Ratio

4.2.1 Identification and Treatment of Qualifying Liabilities

Qualifying liabilities are defined as liabilities which qualify to be fully included as part of the liabilities while computing Minimum Liquid Assets (MLA). Following are included under qualifying liabilities:

1. All liabilities, except bills of exchange, lines of credit, letters of credit and stored value facilities, from customers, other than banks and central banks.
2. All liabilities, except bills of exchange, lines of credit, letters of credit and stored value facilities, from central banks.
3. All liabilities, except bills of exchange, lines of credit, letters of credit and stored value facilities, from banks.
4. Lines of credit and letters of credit that are irrevocable.
5. Liabilities of the bank arising from stored value facilities.
6. Liabilities from bills of exchange meeting any of the below mentioned criteria:
   - Are trade transactions between Singapore domiciled parties
   - Are used for services
   - Are switch transactions between non-Singapore domiciled parties, financed locally after the switch
   - Are overdue and substituted by roll-over
   - Are used for import and financed by the seller
   - Where invoice is already settled, but has not been produced before the legal entity

100 % of the value of qualifying liabilities is included in the stock of qualifying liabilities.

4.2.2 Identification of Liquid Assets

All assets, whether owned by the bank, or received from counterparties as collateral, that meet the liquid asset criteria specified by MAS, are classified as follows:

- Tier 1 Assets
- Tier 2 Assets

4.2.2.1 Identification and Treatment of Tier 1 assets

Tier 1 assets are assets which qualify to be fully included as part of the stock of liquid assets while computing MLA. They include:

1. Cash which includes coins, bank notes and restricted cash. The value included in the stock of liquid assets is the cash balance.
7. Balances with the Central Bank of Singapore
8. Debt Security or Sukuk rated greater than or equal to AA-, and issued by sovereigns or central banks
9. Sukuk rated greater than or equal to AA, and issued by Singapore Sukuk Pte. Ltd.
10. Debt Security or Sukuk, rated greater than or equal to AA-, and issued by sovereigns or central banks, that are held under reverse repo

100 % of the value of Tier 1 liquid assets is included in the stock of liquid assets.

4.2.2.2 Identification and Treatment of Tier 2 assets

Tier 2 assets are assets which qualify to be fully included as part of the stock of liquid assets for MLA computation. They include:

1. Debt Security or Sukuk issued by statutory board of Singapore. If the legal entity's holding is less than or equal to 20% of issue size, then 90% of market value is included, whereas if holding more than 20%, then 50% of market value is included in the stock of liquid assets.
11. Debt Security or Sukuk rated AAA- issued by Bank for International Settlements and PSE. If legal entity's holding is less than or equal to 20% of issue size, then 100% of market value is included, whereas if holding is more than 20%, then 50% of market value is included in the stock of liquid assets.
12. Debt Security or Sukuk rated AAA- issued by corporates and guaranteed by non-Singapore sovereigns. If the legal entity's holding is less than or equal to 20% of issue size then 100% of market value is included, whereas if the holding is more than 20% then 50% of market value is included in the stock of liquid assets.

13. Debt Security or Sukuk rated AAA to AA-, or short term rated as A-1, issued by sovereigns, statutory board, Bank for International Settlements, International Monetary Fund, European Central Bank, European Community, and Multilateral Development Banks. If the legal entity’s holding is less than or equal to 20% of issue size then 90% of market value is included, whereas if the holding is more than 20% then 50% of market value is included in the stock of liquid assets.
14. Debt Security or Sukuk rated AAA to AA-, or short term rated as A-1, issued by corporates and guaranteed by non-Singapore sovereigns. If the legal entity’s holding is less than or equal to 20% of issue size then 90% of market value is included, whereas if the holding more than 20% then 50% of market value is included in the stock of liquid assets.
15. Debt Security or Sukuk rated A- to A+, or short term rated as A-2, issued by sovereigns, statutory boards, Bank for International Settlements, International Monetary Fund, European Central Bank, European Community, and Multilateral Development Banks. If the legal entity’s holding is less than or equal to 20% of issue size then 80% of market value is included, whereas if the holding is more than 20% then 50% of market value is included in the stock of liquid assets.
16. Debt Securities or Sukuk rated A- to A+, or short term rated as A-2 issued by corporates and guaranteed by non-Singapore sovereigns. If the legal entity’s holding is less than or equal to 20% of the issue size then 80% of the market value is included, whereas if the holding is more than 20% then 50% of market value is included in the stock of liquid assets.
17. Debt Securities or Sukuk rated BBB to BBB+, or short term rated as A-3 issued by sovereigns, statutory boards, Bank for International Settlements, International Monetary Fund, European Central Banks, European Community, and Multilateral Development Banks. If the legal entity’s holding is less than or equal to 20% of the issue size then 70% of market value is included, whereas if the holding more than 20% then 50% of market value is included in the stock of liquid assets.
18. Debt Securities or Sukuk rated BBB to BBB+, or short term rated as A-3, issued by corporates and guaranteed by non-Singapore sovereigns. If the legal entity’s holding is less than or equal to 20% of the issue size then 70% of market value is included, whereas if the holding is more than 20% then 50% of market value is included in the stock of liquid assets.
19. Debt Securities rated AAA to AA-, or short term rated as A-1 issued by banks. If the legal entity’s holding is less than or equal to 20% of the issue size then 90% of market value is included, whereas if the holding is more than 20% then 50% of market value is included in the stock of liquid assets.

20. Debt Securities rated A- to A+, or short term rated as A-2, issued by bank's. If the legal entity's holding is less than or equal to 20% of issue size then 80% of market value is included, whereas if holding more than 20% then 50% of market value is included in the stock of liquid assets.
21. Debt Security rated BBB to BBB+, or short term rated as A-3, issued by bank's. If the legal entity's holding is less than or equal to 20% of the issue size then 70% of market value is included, whereas if the holding is more than 20% then 50% of market value is included in the stock of liquid assets.
22. Debt Security rated AAA to AA-, or short term rated as A-1 issued by corporates that are not covered earlier. If the legal entity's holding is less than or equal to 20% of issue size then 90% of the market value is included, whereas if the holding is more than 20% then 50% of the market value is included in the stock of liquid assets.
23. Debt Security rated A- to A+, or short term rated as A-2 issued by corporates that are not covered earlier. If the legal entity's holding is less than or equal to 20% of the issue size then 80% of the market value is included, whereas if holding more than 20%, then 50% of the market value is included in the stock of liquid assets.
24. Debt Security rated BBB to BBB+, or short term rated as A-3 issued by corporates that are not covered earlier. If legal entity's holding is less than or equal to 20% of the issue size then 70% of the market value is included, whereas if the holding is more than 20% then 50% of the market value is included in the stock of liquid assets.
25. For Bills Receivable and Bills Purchase and Discounted in Singapore dollars, 100% of the book value is included in the stock of liquid asset.

4.2.3 Calculation of Minimum Liquid Assets Ratio

MLA is calculated as follows:

Minimum Liquid Asset (MLA) = Total Stock of Qualifying Liabilities / Total Stock of Liquid Asset

1. The application calculates the total stock of qualifying liabilities by taking sum of all the qualifying liabilities mentioned in section Identification and Treatment of Qualifying Liabilities.

26. The application calculates the stock of liquid assets by taking sum of Tier 1 assets and tier 2 assets. The value of Tier 1 and 2 assets to be included in the total stock according to section Identification of Liquid Assets.
27. The application calculates the Minimum Liquid Asset Ratio by dividing Total Stock of Qualifying Liabilities by Total Stock of Liquid Assets.

4.3 Pre-configured MAS Regulatory MLA Scenarios

OFS LRRCMAS supports an out-of-the-box MAS MLA which has the regulatory scenario pre-configured in the form of business assumptions/rules. This section explains the business rules along with the corresponding regulatory reference.

NOTE:

This section provides only the contextual information about all the business rules. For more detailed information refer OFS LRS application (UI).

For detailed Processes and Tasks, refer the Run Chart.

The below table lists the Document Identifiers provided in the column Regulatory Reference of Regulations Addressed through Business Rules.

Regulation Reference Number	Document Number	Document Name	Issued Date
MC	MAS Notice 649	MAS Notice 649 Minimum Liquid Assets and Liquidity Coverage Ratio	28 Nov 14

The list of pre-configured business Rules and assumptions as well as the corresponding reference to the regulatory requirement that it addresses is provided in the tables listed in section Regulations Addressed through Business Rules.

The column Regulatory Reference for each rule or assumptions has reference to the name of the Document Identifiers such as MC, and should be read in conjunction with the Document Identifier listed in the above table.

4.3.1 Regulation Addressed through Business Rules

The application supports multiple pre-configured rules and scenarios based on MAS specified scenario parameters such as inflow rates, outflow rates, run-offs, haircuts and so on.

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed
Tier 1			
1	MAS MLA- Reclassification- Tier 1- Cash, Central Bank Reserves and Bank Notes	This rule classifies the liquid assets as Tier 1 where the standard product type are cash, central bank reserves and bank	The classification of cash, banknotes and Singapore's central bank reserves as Tier 1 asset is configured as part of this rule.

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed
		notes.	
2	MAS MLA- Reclassification- Tier 1- Debt securities	This rule classifies the liquid assets as Tier 1 where the standard product type are debt securities, treasury bills and sukuk.	The classification of >=AA- rated debt securities issued by sovereigns or central banks, and sukuk issued by Singapore Sukuk Pte Ltd. as Tier 1 assets is configured as part of this rule.
3	MAS MLA- Reclassification- Tier 1- Debt securities held under reverse repo	This rule classifies the liquid assets as Tier 1 where Debt securities held under reverse repo.	The classification of >=AA- rated debt securities issued by sovereigns or central banks and sukuk issued by Singapore Sukuk Pte Ltd., which are received as collateral under repurchase agreement as Tier 1 assets is configured as part of this rule.
Tier 2			
4	MAS MLA- Reclassification- Tier 2- Debt securities issued by statutory boards	This rule classifies the liquid assets as Tier 2 where debt securities issued by statutory boards	The classification of debt securities and sukuk issued by statutory boards of Singapore as Tier 2 assets is configured as part of this rule.
5	MAS MLA- Reclassification- Tier 2- Debt securities guaranteed by sovereign, issued by supernationals	This rule classifies the liquid assets as Tier 2 where debt securities guaranteed, issued by supernationals.	The classification of AAA rated debt securities and sukuk issued by Bank for International Settlements and PSE as Tier 2 assets is configured as part of this rule. Additionally, the classification of AAA rated corporate debt securities that are guaranteed by sovereign, as Tier 2 assets is configured as part of this rule.
6	MAS MLA- Reclassification- Tier 2- Debt securities issued by sovereign or supernationals	This rule classifies the liquid assets as Tier 2 where the debt securities are issued by sovereigns or supernationals.	The classification of debt securities and sukuk rated AAA to BBB- or short term rated A-1 to A-3, issued by sovereigns, statutory boards, Bank for International Settlements, International Monetary Fund, European Central Bank, European Community and Multilateral

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed
			Development, as Tier 2 assets is configured as part of this rule.
7	MAS MLA- Reclassification- Tier 2- Corporate debt securities guaranteed by sovereign	This rule classifies the liquid assets as Tier 2 where corporate debt securities are guaranteed by sovereign.	The classification of debt securities and sukuk rated AAA to BBB- or short term rated A-1 to A-3, having outstanding issue size greater than 200 Singapore dollars, that are guaranteed by sovereign, as Tier 2 assets is configured as part of this rule.
8	MAS MLA- Reclassification- Tier 2- Debt securities issued by banks and other corporate	This rule classifies the liquid assets as Tier 2 where debt securities are issued by banks and corporates.	The classification of debt securities and sukuk rated AAA to BBB- or short term rated A-1 to A-3, issued by banks, having outstanding issue size greater than 200 Singapore dollars, as Tier 2 assets is configured as part of this rule.
9	MAS MLA- Reclassification- Tier 2- Bills of Exchange	This rule classifies the liquid assets as Tier 2, which are issued by bills of exchange.	The classification of bills purchase and discounted and bills receivable as Tier 2 assets is configured as part of this rule.
Qualifying Liabilities			
10	MAS MLA- Reclassification- Qualifying Liabilities- Issued bills of exchange	This Rule classifies the Qualifying Liabilities - Issued by bills of exchange.	The classification of bills of exchange issued by bank as qualifying liabilities assets under MLA regime is configured as part of this rule.
11	MAS MLA- Reclassification- Qualifying Liabilities- Issued bills of exchange- Overdue	This Rule classifies the Qualifying Liabilities- Issued by bills of exchange which has overdue in bills of exchange.	The classification of bills of exchange issued by bank that are overdue and are rolled-over, as qualifying liabilities under MLA regime is configured as part of this rule.
12	LRM - MLA Qualifying Liabilities -All Liailities Except central bank and banks	This rule classifies the qualifying liabilities for all liabilities except central bank and banks	The classification of all the liabilities other than dues to central banks and banks, as qualifying liabilities under MLA regime is configured as part of this rule.

Sl. No.	Rule Name	Rule Description	Regulatory Requirement Addressed
13	LRM - MLA Qualifying Liabilities -All assets Except Bills of Exchange	This rule classifies the qualifying liabilities for all assets except bills of exchange	The classification of all the assets due to central banks and banks on a gross basis is configured as part of this rule.
14	LRM - MLA Qualifying Liabilities -Central bank and banks	This rule classifies the qualifying liabilities for central bank and banks	The classification of all the liabilities due to central banks and banks on a net basis i.e. after subtracting any claims on central bank and bank respectively, as qualifying liabilities under MLA regime is configured as part of this rule.
15	LRM - MLA Qualifying Liabilities -Line of Credit, LC and SVF	This rule classifies the qualifying liabilities for line of credit, LC and SVF	The classification of lines of credit and letters of credit that are irrevocable, as qualifying liabilities under MLA regime is configured as part of this rule. Additionally, liabilities of the bank arising from stored value facilities is also configured as part of this rule.
16	MAS MLA-Value to be included in the Stock of Liquid Asset	This rule updates the stock of liquid asset in the FSI_LRM_INSTRUMENT table	The computation of the value of the total stock of eligible liquid asset is configured as part of this rule.
17	MAS MLA-Mitigant Value to be included in the Stock of Liquid Asset	This rule updates the mitigant value to be included in stock of liquid assets in the FSI_LRM_INSTRUMENT table	The identification and computation of the value of the non-rehypothecated portion of liquid asset collateral received under re-hypothecation rights are configured as part of this rule.

5 Appendix A – Data Transformations/Functions used in LRRCMAS

This section provides information about the Data Transformations (DTs) or functions used in LRRCMAS application.

- **TB_DATE_ASSIGNMENT**

This function performs the following:

a. Identifies the dates between the bucket start day and bucket end day.

b. Populates the intermediate dates based on the chosen FIC-MIS date, in FSI_LRM_TIME_BUCKET_DAYS.

c. The business day convention (prior, conditional prior, following, no-Adjustment) gets applied, taking into account the holiday calendar applicable for a Legal Entity, and gets populated in FSI_LRM_TIME_BUCKET_DETAILS for each Legal Entity.

- **MAS_INS_UNINS_AMT_CALC**

This function calculates the insured and uninsured amounts taking the data from FCT_DEPOSIT_INSURANCE_DETAILS and updates this information at an account-customer combination in the FSI_LRM_ACCT_CUST_DETAILS table. It then takes the insured and uninsured amounts from FSI_LRM_ACCT_CUST_DETAILS and aggregates the value at account level and updates FSI_LRM_INSTRUMENT table which will be further used in the application for processing.

- **UPD_PROCESS_SCENARIO_KEY**

This function updates the process scenario Skey in DIM_FCST_RATES_SCENARIO tables. It performs the following:

a. Reads the current Run information from FCT_LRM_RUN_PARAM and DIM_RUN tables.

b. Populates the Contractual/Business as usual Run name, Run type, Run description into DIM_FCST_RATES_SCENARIO table from DIM_RUN.

c. Updates the process key for current Run in FCT_AGG_BASE_CCY_LR_GAP table storing liquidity risk gap measures in base currency.

d. Updates the process key for current Run in FCT_AGG_BASE_CCY_LR_GAP table storing liquidity risk gap measures in consolidated currency.

e. Updates both local and natural, inflow and outflow amount columns in FCT_AGG_CASH_FLOWS using exchange rate conversion.

f. Updates both inflow and outflow local currency amount columns in FCT_ACCOUNT_CASH_FLOWS using exchange rate conversion.

g. Updates both local and natural currency amount columns in FCT_LRM_LE_SUMMARY using exchange rate conversion.

- **UPDATE_UNDERLYING_ASSETS**

  This function updates all the attributes of the underlying assets, mitigants or placed collateral of an account such as asset level, fair value, market value, and so on, in the FSI_LRM_INSTRUMENT table. For example, consider a loan contracts for which a mitigant is received. This loan account is captured in STG_LOAN_CONTRACTS table and the mitigant information is captured in STG_MITIGANTS. The link between the loan account and the mitigant is captured in STG_ACCOUNT_MITIGANT_MAP table. From STG_ACCOUNT_MITIGANT_MAP table, data moves to FCT_ACCOUNT_MITIGANT_MAP table.

  The function identifies the account mitigant mapping from FCT_ACCOUNT_MITIGANT_MAP and updates the attributes of the mitigant against the loan account in FSI_LRM_INSTRUMENT table. For example, if the market value of the mitigant is $500, then the function updates the column FSI_LRM_INSTRUMENT.N_UNDERLYING_RECV_LEG_MKT_RCY as $500 for the loan contract account.

  Similarly, consider another example of repo contract where the bank has placed collateral. The repo contract is captured in STG_REPO_CONTRACTS and moved to FSI_LRM_INSTRUMENT table. The collateral placed against the repo contract is captured in STG_PLACED_COLLATERAL table. The relationship between placed collateral and the REPO contract is captured in STG_ACCT_PLACED_COLL_MAP and is moved to FCT_ACCT_PLACED_COLL_MAP.

  The function updates the asset level of the placed collateral against the repo contract in FSI_LRM_ISNTRUMENT table, which indicates that the FSI_LRM_INSTRUMENT.N_UNDERLYING_ASSET_LEVEL_SKEY is updated.

  Similarly, the function updates the following attributes of the underlying asset (Mitigant/Placed Collateral) in FSI_LRM_ISNTURMENT table:

  - N_UNDERLYING_ASSET_LEVEL_SKEY
  - N_UNDERLYING_MKT_RCY
  - N_UNDERLYING_FAIR_RCY
  - F_UNDERLY_QUALIF_UNENCUMB
  - N_UNDERLY_RISK_WEIGHT_SKEY
  - N_UNDERLY_STD_ISSUER_TYPE_SKEY

- N_UNDERLY_STD_PROD_TYPE_SKEY
- N_UNDERLYING_INST_BASEL_RATING
- F_UNDERLY_COLL_COVER_SHORT_POS
- F_UNDRLY_COVER_BANK_SHORT_POS
- F_UNDRLY_COVER_CUST_SHORT_POS
- F_UNDERLY_ISSUER_FINAN_ENTITY
- F_UNDERLY_REHYPOTHECATED_FLAG
- F_UNDERLYING_ISSUER_US_FLAG
- F_UNDERLYING_GUARANTOR_US_FLAG
- F_UNDRLYNG_PLACED_HQLA_FLAG
- F_UNDERLYING_HELD_BY_CLIENT
- F_UNDRLYNG_ASST_SEGREGATED_IND
- N_HQLA_MIT_VAL_RCY
- N_NON_HQLA_MIT_VAL_RCY
- N_EXP_NOT_COV_BY_HQLA_MIT_RCY

These columns are used for calculating the adjustments to be performed in the stock of HQLA process and also in business as usual assumptions.

This DT identifies the underlying asset of an account from the mapping tables (FCT_ACCOUNT_MITIGANT_MAP and FCT_ACCT_PLACED_COLL_MAP), reads the attributes of the underlying asset (mitigant from FCT_MITIGANTS and placed collateral from FSI_LRM_INSTRUMENT) and updates the same against the account in FSI_LRM_INSTURMENT table using the following steps:

a. Assigns the used portion of a placed collateral in FCT_ACCT_PLACED_COLL_MAP table, that is, updates FCT_ACCT_PLACED_COLL_MAP.N_DRWN_PORTION_COLL_AMT.
b. Assigns the underlying asset level.
c. Assigns the underlying asset level Skey of SUBSTITUTABLE COLLATERAL to
    - Derivative Products
    - Non-Derivative Products

    Updates the N_COLL_SUBSTITU_ASSET_LVL_SKEY and N_SBSTBL_ASST_LVL_ENT_SKEY of FSI_LRM_INSTRUMENT table

d. Assigns revised maturity date Skey for ('CS','REVREPO','DRB','SECBORR') product, that is FLI.N_REVISED_MATURITY_DATE_SKEY.

Updates the encumbrance percent in FSI_LRM_INSTRUMENT against the placed collateral records, that is, FLI.N_PERCENT_ENCUMBERED.

- **FN_SECURED_TRANS_COLL_ALLOC**

This DT is used to populate the following attributes in FSI_ACCT_COLL_MAP_DETAILS table for all secured transactions

- Account to Collateral level mapping
- collateral percentage
- End of period Balance
- Collateral Value
- Collateral Asset Level against each collateral for both received and posted collateral
- Account Covered by Collateral, Account Coverage Percentage
- Total Secured Portion in Percentage and Secured Balance Amount of an account
- Total Unsecured Portion in Percentage and Unsecured Balance Amount of an account
- Used and Unused portion of the collateral
- Collateral as a Percentage of Total Secured Balance

Any other Dimension required at this granularity for defining a Business Assumption on a Secured Transaction

6 Appendix B – User Configuration and Settings

6.1 Standard Reclassifications

The regulatory guidelines specify classifications and computations based on certain generic product and party types. Each bank, internally, will have its own product and party types, which differ from bank to bank. In order to ensure consistency in computations, the application supports two standard dimensions based on the regulatory guidelines:

- Standard Product Type
- Standard Party Type

The bank specific product and party types, which are accepted as a download in the staging tables, are required to be reclassified to standard product and party types supported by OFS LRRCMAS respectively.

6.1.1 Standard Product Type Reclassification

Banks should to map their specific product types to the Standard Product Types as part of the rule MAS LCR - Standard Product Type Reclassification. The application then reclassifies the bank product types to Standard Product Types and utilizes the Standard Product Types for further processing.

6.1.2 Standard Party Type Reclassification

Banks are required to map their specific party types to the Standard Party Types as part of the rule LRM - Standard Party Type Reclassification. The application then reclassifies the bank party types to Standard Party Types and utilizes the Standard Party Types for further processing. Party types include customer type, issuer type and guarantor type.

NOTE: For MLA calculations reconfigure the rules MAS MLA- Reclassification- Tier 2- Bills of Exchange and MAS MLA- Reclassification- Qualifying Liabilities- Issued bills of exchange, after account purpose table is loaded.

6.2 Mitigant Sub Type Classifications

Banks are required to map their mitigant product types to the Standard Product Types as part of the rule LRM - Mitigant Sub Type Classification. The application then reclassifies the bank mitigant types to Standard product Types, and utilizes this for further processing.

Oracle Financial Services Liquidity Risk
Regulatory Calculations for Monetary Authority
of Singapore
February 2019

Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.

Worldwide Inquiries:
Phone: +1.650.506.7000
Fax: +1.650.506.7200

oracle.com