# Oracle Financial Services Liquidity Risk Management

## User Guide

## Release 8.0.6.0.0

ORACLE
Financial Services

Oracle Financial Services Liquidity Risk Management User Guide, Release 8.0.6.0.0



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# TABLE OF CONTENTS

# TABLE OF FIGURES

# TABLE OF TABLES

# DOCUMENT CONTROL

| Version Number | Revision Date | Changes Done |
|---|---|---|
| 1.0 | Created May 2018 | Captured updates for 8.0.6.0.0 release:<br>▪ ALTA Theme adoption – all the user interface screenshots have been updated to reflect the ALTA theme changes.<br>▪ LRM Data Flow and Dimensions – Updated the list of dimensions<br>▪ Added section Performance Related Configurations for RBI Contractual<br>▪ Added section Audit logging |
| 2.0 | Updated June 2018 | Added links to Change Log, List of Deprecated Items and other technical documents, in section Related Information Sources |

This document provides a comprehensive working knowledge on Oracle Financial Services Liquidity Risk Management, Release 8.0.6.0.0. 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

The objective of this user guide is to provide a comprehensive working knowledge on Oracle Financial Services Liquidity Risk Management, Release 8.0.6.0.0. This user guide is intended to help you understand the key features and functionalities of Oracle Financial Services Liquidity Risk Management (LRM) release 8.0.6.0.0 and details the process flow and methodologies used in the computation and management of Liquidity Risk.

This User Guide should be used in conjunction with the documents listed in the Related Information Sources section, to get a complete view of the LRM application capabilities. Additionally, this document provides the configurations required to address all the liquidity risk related needs of a financial institution.

## INTENDED AUDIENCE

Welcome to release 8.0.6.0.0 of the Oracle Financial Services Liquidity Risk Management User Guide. This manual is intended for the following audience:

- Business User: This user reviews the functional requirements and information sources, like 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 Analyst: This user would be involved with cleaning, validation, and importing of data into the OFSAA Download Specification Format.

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## RELATED INFORMATION SOURCES

- OFSAA Liquidity Risk Management Application Pack 8.0.6.0.0 Release Notes on OHC Documentation Library
- OFSAA Liquidity Risk Management Application Pack 8.0.6.0.0 Installation Guide on OHC Documentation Library
- OFS Liquidity Risk Management Release - Regulatory Calculations 8.0.6.0.0 User Guide on OHC Documentation Library
- OFS Liquidity Risk Management Release 8.0.6.0.0 Analytics User Guide on OHC Documentation Library
- OFS Liquidity Risk Management Release 8.0.6.0.0 List of Deprecated Items and other Technical Documents on MOS
- OFS Liquidity Risk Management Release 8.0.6.0.0 Change Log on OHC Documentation Library
- OFS Analytical Applications Infrastructure User Guide on OHC Documentation Library

# What's New in this Release

The Oracle Financial Services Liquidity Risk Management Release 8.0.6.0.0 is an enhancement of the existing Oracle Financial Services Liquidity Risk Management Release 8.0.5.0.0 which has the following enhanced features:

- Alta Theme adoption

  Alta theming is adapted across OFSAA screens to provide sharper User Interface (UI) and usability to enhance user experience.

- Logging
  - Audit Logging- Enables audit logging for all operations performed on LRM Objects.
  - Application Logging- System log format has been standardized.

**Note**: Oracle Financial Services Liquidity Risk Management (OFS LRM) Application pack was previously known as Oracle Financial Services Treasury Risk (OFS TR) Application pack. OFS TR application pack has been renamed to Oracle Financial Services Liquidity Risk Management (OFS LRM) application pack, Release 8.0.6.0.0 onwards.

# 1 Introduction to Oracle Financial Services Liquidity Risk Management (OFS LRM)

Liquidity Risk Management (LRM) has emerged as a critical risk management function for banking institutions, as regulators increasingly require banks to have a robust liquidity management framework in place. As per the Basel Committee on Banking Supervision (BCBS), "liquidity is the ability of a bank to fund increases in assets and meet obligations as they come due, without occurring unacceptable losses". Oracle Financial Services Liquidity Risk Management is designed to address liquidity risk of banking institutions across the world. It helps financial institutions to

- Drive liquidity ratio regulatory compliance and adhere to tight regulatory deadlines through pre-packaged rules and computations
- Engage in enterprise-wide comprehensive stress testing that feeds into the contingency funding planning process
- Improve risk reporting practices by leveraging an extensive set of reports and dashboards built out of a unified data model

## 1.1 Overview

Oracle Financial Services Liquidity Risk Management comprehensively addresses an organization's liquidity risk requirements, both regulatory and management, through a flexible user interface, robust calculations, and advanced reporting. It supports pre-configured calculations, scenarios, and reporting templates to ensure full compliance with BIS Basel III guidelines, US Liquidity Coverage Ratio calculation and 4G liquidity reporting guidelines (popularly known as US Federal Reserve FR 2052 a and FR 2052 b Liquidity Monitoring templates).

The Liquidity Risk Management Application among others contains the following functionalities:

- Liquidity Gap Calculations
- Liquidity Ratio (as per BIS and US Federal Reserve Guidelines) and Funding Concentration Calculation
- Intraday Liquidity Management
- Counterbalancing
- Stress Testing
- Run Management

An overview of the above functionalities in the Liquidity Risk Management Application is given in the following sections:

### 1.1.1 Liquidity Gaps

Liquidity gap is the mismatch in a bank's inflows and outflows from various assets and liabilities, due to the difference in the behavior exhibited by the customers. This gap can be positive or negative, depending on if the bank has more inflows than outflows and vice versa.

For banks, the liquidity gap can change over the course of the day as deposits and withdrawals are made. This means that the liquidity gap is more of a quick snapshot of a bank's risk.

Liquidity Gap can also depicted by the formula, Cash Inflows – Cash Outflows.

### 1.1.2 Liquidity Ratio and Funding Concentration

Various parameters in Liquidity Risk Management help in analyzing the liquidity status of the bank. Liquidity ratios are one such parameter prescribed in the Basel III Guidelines. There are three types of ratios calculated by the LRM application, which are as follows:

- Liquidity Coverage Ratio: Liquidity coverage ratio addresses the short-term liquidity needs of an 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). Liquidity coverage ratio is calculated at the legal entity level on a standalone and consolidated basis. Liquidity coverage ratio is also calculated at the level of each significant currency in order to identify potential currency mismatches, which is known as Foreign Currency Liquidity Coverage Ratio.
- Net Stable Funding Ratio: This addresses the medium and long-term liquidity needs of a bank during a stress situation. It specifies the minimum amount of stable funding required to be maintained in order to promote stable long term funding.
- Funding Concentration: Wholesale funding from significant sources is calculated in order to monitor the liquidity risk arising from the withdrawal of such funds. Funding concentration is calculated on the basis of following dimensions:
  - Concentration by Significant Counterparties
  - Concentration by Significant Products
  - Concentration by Significant Currencies

### 1.1.3 Intraday Liquidity Management

Intraday liquidity Risk Management refers to the ability of a bank by to discharge its payment and settlement obligations in a timely basis on any business day.

Oracle Financial Services Liquidity Risk Management application helps to measure and report intraday liquidity positions under normal conditions and stress scenarios. OFS LRM Solution uses two approaches to manage Intraday Liquidity Risk:

- **Intraday Liquidity Monitoring Metrics:**

Intraday Monitoring Metrics relating to Payment Positions, Intraday Sources, Time Specific Obligations, Throughput, and so on are calculated and reported as a part of this approach. Computation of these metrics happens at the end of the day. This is catered through a Run using the Run Management window in the OFS LRM application. The metrics are calculated for each selected date based on actual intraday payments made and received as part of the contractual Run. Dashboard Reports and Regulatory Reports are also a part of this feature.

- **Real Time Intraday Monitoring:**

  Real Time Intraday Monitoring feature enables a bank to view its net positions and intraday sources in Real time. Dashboard Reports relating to Payments, Net intraday positions, Time specific obligations and so on can be viewed and refreshed in Real Time within the day.

### 1.1.4 Counterbalancing

As part of their liquidity governance process, financial institutions are required to have formal contingency funding plans for addressing liquidity needs during periods of stress. The Counterbalancing Strategy module of Oracle Financial Services Liquidity Risk Management aids banks in developing such contingency funding plans to address the liquidity hotspots observed during stress scenarios of varying magnitudes.

A counterbalancing strategy consists of one or multiple counterbalancing positions covering the fire sale of marketable and fixed assets, creation of new repos, rollover of existing repos and raising fresh deposits or borrowings. These can be easily configured by selecting the individual instrument, asset or product and specifying the parameters such as haircuts, sale percent, rollover rate and so on, based on the type of position. Once, the counterbalancing positions are specified, the strategy is applied to the existing liquidity gaps in order to assess its impact.

### 1.1.5 Stress Testing

Stress testing is now an integral part of a bank's risk measurement system and plays an important role in estimating the effects of potential financial crises on a bank's operations. Stress testing or risk estimation technique refers to the process of examining the stability of a system or entity in adverse conditions. It involves testing beyond normal operational capacity, often to a breaking point, in order to observe the results.

Stress testing is an integrated framework of OFSAAI which supports the stress testing requirements across the entire suite of OFSAAI products including Liquidity Risk Management. It allows banks to define shocks and assess the impact of such shocks across multiple business areas.

Stress testing provides adverse values of business assumptions such as rollover rates, run-off rates and so on, and replaces the Business As Usual (BAU) assumptions with these stress assumptions.

### 1.1.6 Run Management

Run Management allows you to define, approve, and execute Runs in the LRM application. Different types of Runs are defined using the Run Framework of the Oracle Financial Services Analytical Applications Infrastructure (OFSAAI) and executed using the Run Management window in the LRM application.

The types of Runs are as follows:

- **Contractual Run**

  This is the first Run defined using the Run Management window of the LRM application.

  A contractual Run allows you to estimate liquidity gaps based on the contractual cash flows received as a download from the bank. All inflows and outflows of cash are assumed to be generated based on the terms of the contract. The liquidity metrics, both gaps and ratios, are estimated on a standalone (Solo) basis for each selected legal entity or on a consolidated basis at the level of the selected legal entity. The gap report enables the analysis of the current liquidity gaps in each time bucket purely based on contractual terms. Contractual Execution caters to the as of date liquidity status of the organization without the application of any business assumption. Contractual Runs are defined for long term buckets.

  The purpose of defining contractual Run is to execute BIS Basel III Liquidity Runs to calculate Gap to report liquidity gaps in each time bucket (Cash Inflow – Cash Outflow).

  This forms the base for BAU Run with combination of single or multiple business assumptions.

  Assumptions are applied either on original balance or cash flows or the changing balance or cash flows across business assumptions.

- **Business As Usual**

  After defining and executing a contractual Run, business assumptions such as rollovers, Run-offs, prepayments, delinquencies, haircuts, and so on, are to be defined and applied to the contractual cash flows, through BAU execution. This execution computes the liquidity position of the organization under business – as – usual or normal conditions by assessing the impact of the BAU assumptions on the contractual cash flows. The contractual Run forms the base for BAU Run with combination of single or multiple business assumptions. The assumptions are applied either on original balance or cash flows or the changing balance or cash flows across business assumptions.

- **Stress Run**

  After defining and executing business assumptions, a stress Run is created through the Stress Definition module of AAI. A business-as-usual Run is selected as the baseline Run and the BAU assumptions which are part of the selected baseline Run are replaced by stress business assumptions. Replacement of a set of BAU assumptions with another set of stress assumptions constitutes a scenario for stress testing within LRM. Stress business

assumptions are similar to BAU assumptions, but with adverse or stressed values. On execution of the stress Run, the business assumptions are applied to contractual cash flows to assess the impact of the scenario on the liquidity metrics.

## 1.2 LRM Process Flow

The following is the Liquidity Risk Management process flow:

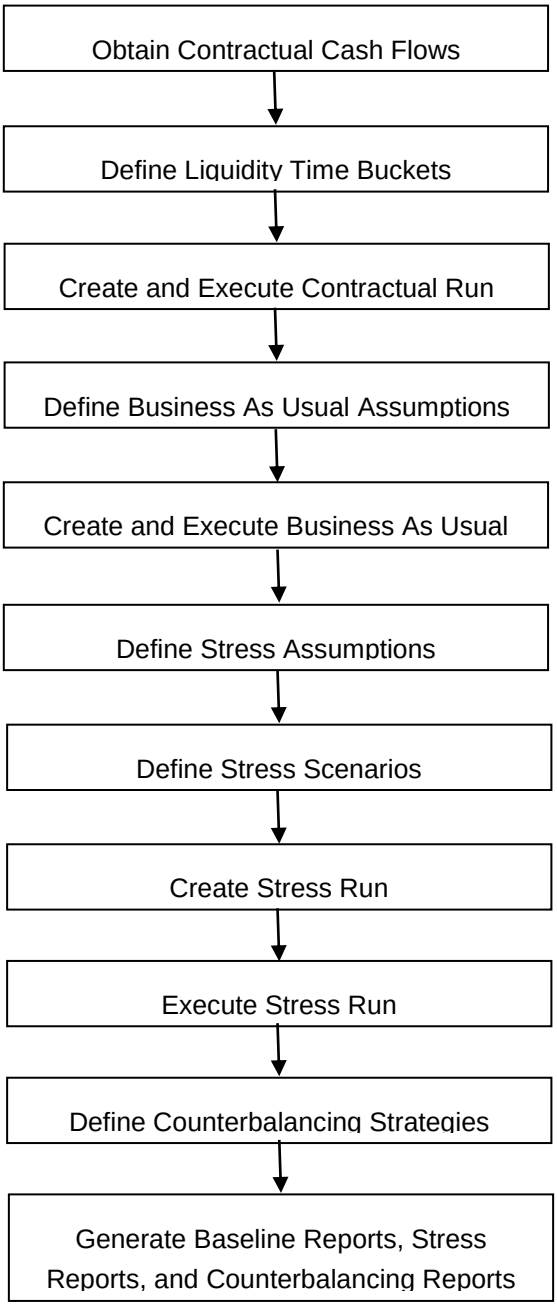



**Figure 1 LRM Process Flow**

a. **Obtaining Contractual Cash Flows and Liquidity Buckets**: The process of liquidity risk management begins in OFS LRM, after obtaining the contractual cash flows as a download from the ALM systems. If OFS ALM is installed, the required cash flows can be selected from the Application Preferences window of OFS LRM. Once, the contractual cash flows are selected,

liquidity time buckets need to be defined. The liquidity buckets may be multi-level time buckets. The contractual cash flows need to be bucketed, in order to calculate the liquidity gaps, ratios, and to perform other analysis. These may be estimated on solo basis or consolidated basis.

**b. Executing Contractual Run:** The Contractual Run is then executed. A Contractual Run does not anticipate any change from the normal behavior and goes according to the contractual terms. For that, the cash flows are first converted to the local or reporting currency. Cash flows are then assigned to time buckets and liquidity gaps under contractual terms are estimated. Cash flows need to be aggregated too as they will be large in number and it will take time to execute them individually. For example, during the Exadata tuning test that was conducted in October 2014, for OFS LRM, 20 billion cash flows were aggregated to 9 million cash flows. The Contractual Runs can be scheduled to run overnight as and when data arrives from each Line of Business (LOB).

c. **Executing BAU Run**: Once the liquidity gaps are estimated under contractual terms, the changes in cash flows during the normal course of business due to consumer behavior are to be estimated. This involves defining business assumptions based on multiple rules and specifying assumption values. For example, following is an assumption: “20% of retail loans with maturity less than 6 months are prepaid in the 1-month bucket”. Assumption values specified for each dimension member combination, is selected from pre-defined business hierarchies/dimensions. Once these assumptions are defined, they are grouped together and applied to contractual cash flows as part of the BAU Run or Baseline Run execution process. BAU Runs are scheduled to run overnight as and when, data arrives from each LOB. The impact of these business assumptions on liquidity gaps, ratios, and other metrics is estimated.

d. **Executing Stress Run**: The next step in the liquidity risk process is stress testing, which begins with defining stress values for business assumptions. A baseline rule is replaced by one or multiple stress rules to create stress scenarios. The stress scenario mapped to a Baseline Run, to generate a Stress Run. Stress values are specified for each dimension member combination, selected from pre-defined business hierarchies/dimensions. Stress Runs are scheduled to run overnight, intra-day, or at any other frequency. The Stress Run is executed and the impact of the scenario on liquidity gaps, ratios, and other metrics is estimated.

e. **Counterbalancing Strategies**: Once the Runs are executed, the liquidity gaps are analyzed to identify liquidity mismatches which could cause potential losses. These are managed by defining and applying counterbalancing strategies. Counterbalancing strategies can be applied to Contractual Runs, BAU Runs, and Stress Runs.

   Counterbalancing strategies are a combination of one or multiple counterbalancing positions which include sale of assets, creation or rollover of repos, new funding, and so on.

f. **LRM Reports**: Finally, LRM generates reports like Baseline Reports, Stress Reports, and Counterbalancing Reports that enable a detailed view of the liquidity risk metrics.

# 2 Getting Started with OFS LRM

To access the LRM application you need to log into OFSAAI environment using the following window.

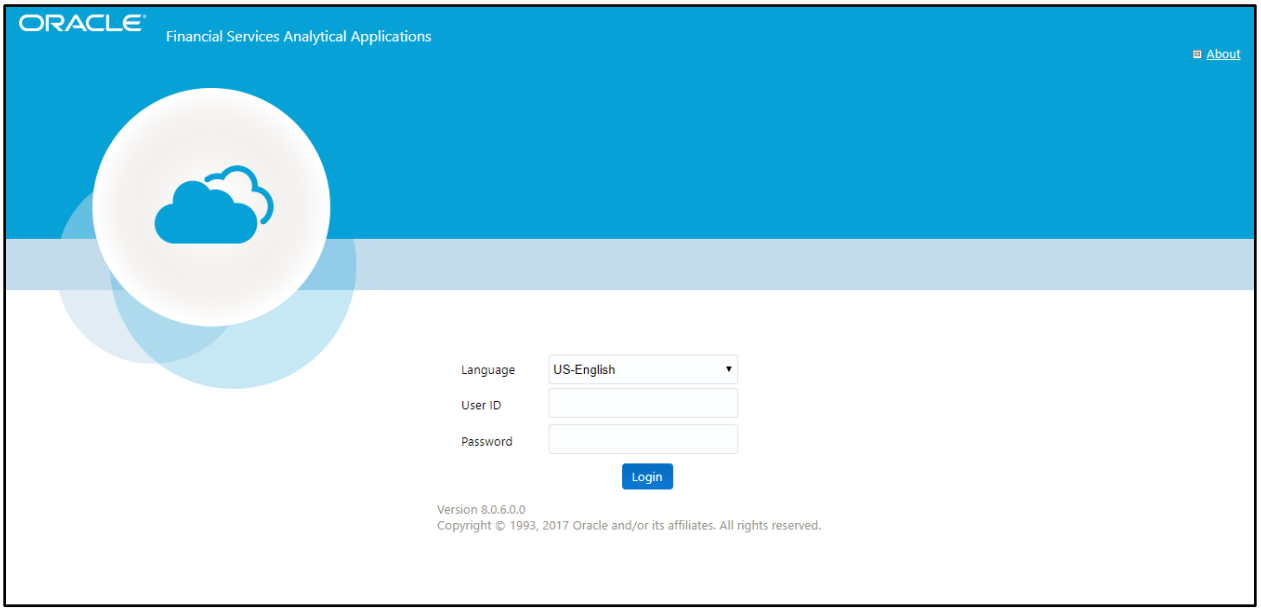
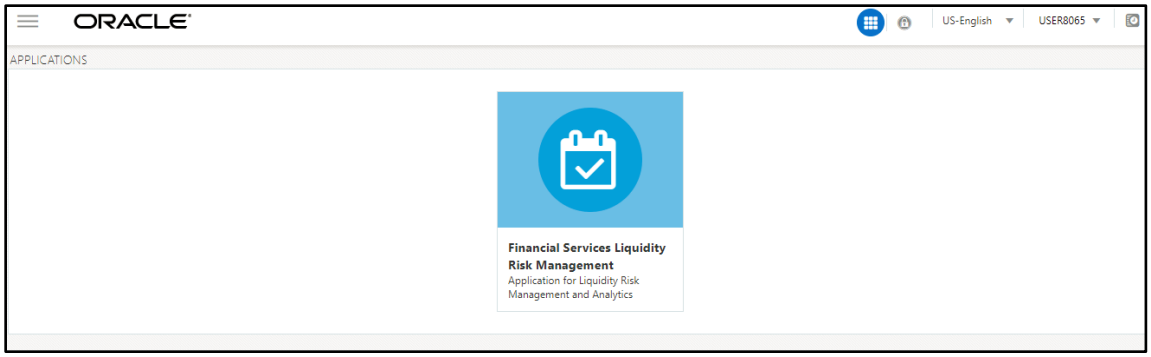



**Figure 2 OFSAAI Log in**

| Tag | Description |
|---|---|
| Language | Select the language in this field. |
| User ID | Enter the User ID to Login. |
| Password | Enter the password to Login. |
| Login | Click the Login Button after providing User ID and Password for Login. |

**Table 1 OFSAAI Log In**

When you log into OFSAAI, the home page is displayed.




Click **Financial Services Liquidity Risk Management.** The landing page is displayed.

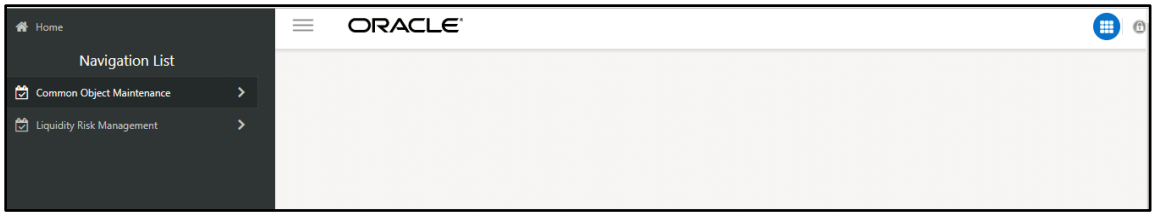



**Figure 3 OFSAAI – Treasury Pack Link**

| Tag | Description |
|---|---|
| TREUSER | Click this button to select the following options: Preferences, About, Change Password or to logout. |
|  | Click the icon and select the Financial Services Liquidity Risk Management where the LRM Application is installed. |
|  | Click this icon to view the Administration related tools such as Translation Tools and Process Modelling Framework. |
|  | Click this icon to view details of the last login and last failed login date and time. |
| Common Object Maintenance | Common Object Maintenance is an integral part of the Infrastructure system and facilitates system administrators to define the security framework with the capacity to restrict access to the data and metadata in the warehouse, based on a flexible, fine-grained access control mechanism. For more information refer *OFS Analytical Applications Infrastructure User Guide on OHC*. |
| Liquidity Risk Management Link | Click this link to view the options under LRM. |

**Table 2 OFSAAI**

# 3 Application Preferences

## 3.1 Overview

The Application Preferences tab helps to select some set-up parameters required for LRM processing. These include selection of Contractual Cash Flow processes, mandatory dimensions and aggregation dimensions. LRM Functional Administrator can set the application preferences.

**NOTE:** For an LRM Analyst, with LRM Approver or LRM Reviewer role, to view the Application Preferences tab, you must map the function "View LRM Application Preference" in **System Administration** > **Function – Role Map** in Oracle Financial Services Analytical Applications window. For more information refer Appendix A of OFSAAI User guide available in OHC Documentation Library.

## 3.2 Understanding Application Preferences

In **Oracle Financial Services Analytical Applications Infrastructure** home screen, select **Financial Services Liquidity Risk Management.**

To open the **Application Preferences** window, choose **Liquidity Risk Management** > **Application Preferences** on the Left-Hand Side (LHS) menu.

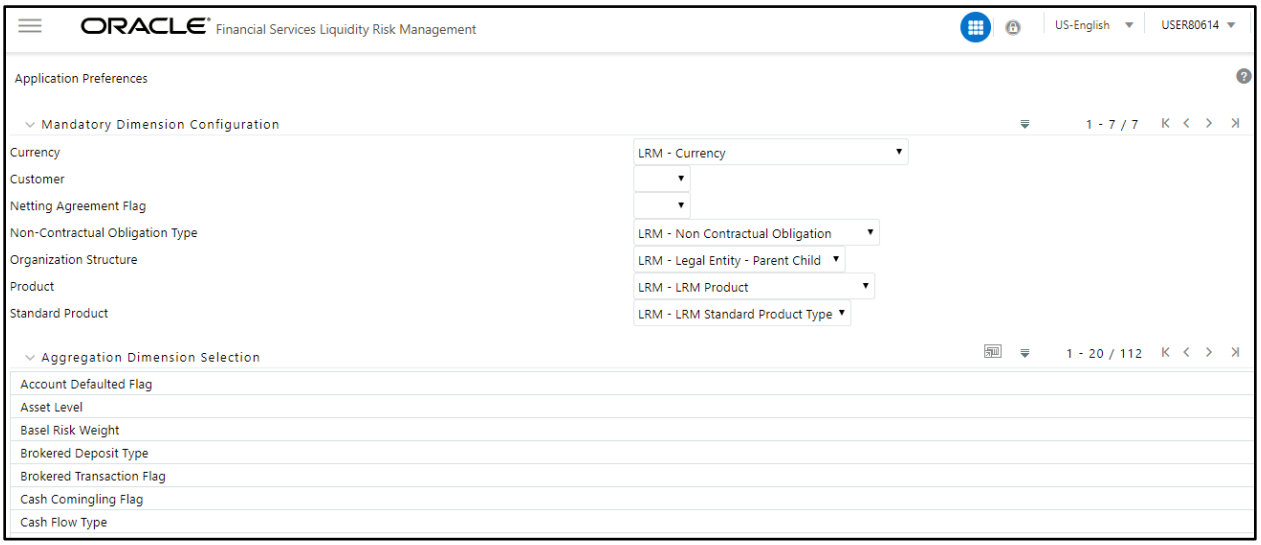



**Figure 4 Application Preferences**

The Application Preferences window has the following sections:

- Contractual Cash Flow Process Selection
- Mandatory Dimension Configuration
- Aggregation Dimension Selection

## 3.3 Contractual Cash Flow Process Selection

**NOTE:** This section is applicable only when both OFS LRM and OFS ALM are installed in the same information domain (infodom).

Contractual Cash Flow Process Selection displays a list of ALM Processes which are executed for cash flow generation. The cash flow engine in ALM can be executed in one or multiple processes; these can be Contractual or Scenario based. Each of them generates cash flows for various asset and liability products. LRM processes these cash flows and this list displays the available ALM cash flows processes.

To select the process for Contractual Cash Flow Process, perform the following steps.

1. On the Application Preferences window, under Contractual Cash Flow Process Selection, click  to select the process. The browser is displayed.

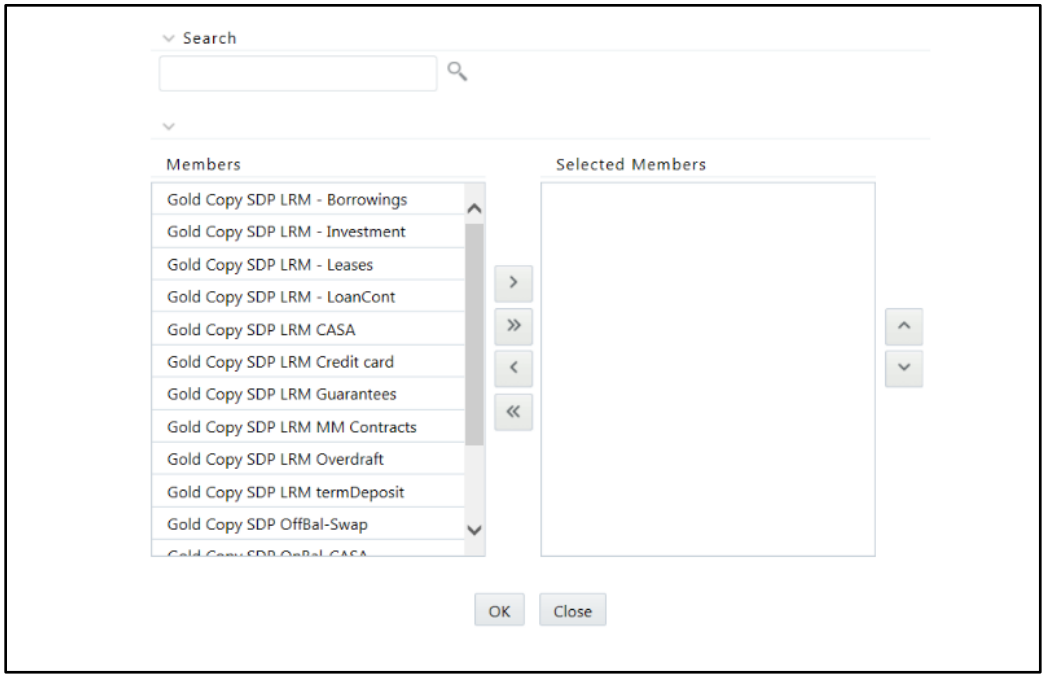



**Figure 5 Contractual Cash Flow Process Selection**

2. Select one or multiple contractual cash flow processes, the outputs of which will be used by LRM.
3. Click  to move the selected items to Selected Members section, or click  to select all members.
4. Using  up or down arrows, you can sequence the contractual cash flow processes.
5. Click **OK**. The process IDs are stored in appropriate tables. The application selects all the cash flows that have a ALM cash flow engine's process IDs which are associated

with this and picks up these IDs that is, once it is stored, it picks up the relevant cash flows against the process IDs.

## 3.4 Mandatory Dimension Configuration

The LRM application requires some dimensions to be selected mandatorily for downstream calculations. These include currency, organization structure, and standard product. The parameters selected as part of this field are displayed in the BAU window under the Dimension browser.

The Mandatory Dimension Configuration section has the following fields:

- Currency
- Customer
- Organization Structure
- Netting Agreement Flag
- Non-Contractual Obligation Type
- Product
- Standard Product

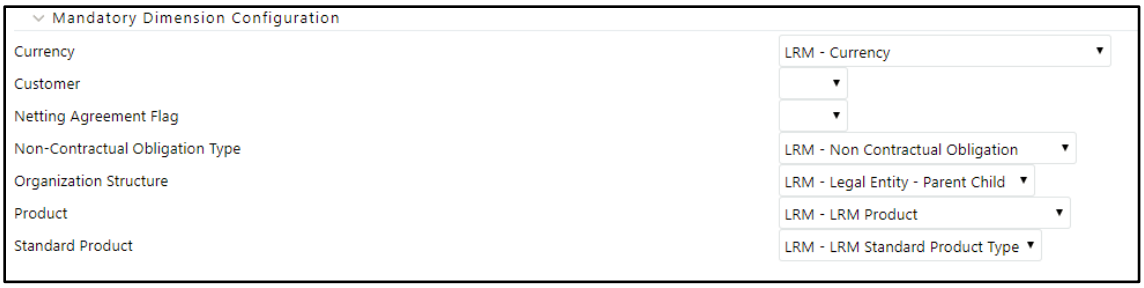



**Figure 6 Mandatory Dimension Configuration**

1. **Currency**:

   For Currency, only one hierarchy is present. LRM - Currency is automatically selected in the Currency field.

2. **Customer**:

   To identify the intercompany cash flows, customer dimension is mandatory. However there is no hierarchy selection required.

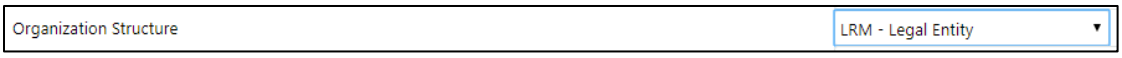
3. **Organization Structure**:

   For Organization Structure, there are multiple selections. Select either of the following:

   - LRM – Legal Entity: This is a BI Hierarchy where all the legal entities appear in a single level.

- LRM – Legal Entity – Parent Child: This is a parent child hierarchy where the legal entities are displayed in ascending/descending order of their parentage. The root being BHU (Business Holding Unit).
- LRM – Org Structure Country Flag: This is a Non-BI Hierarchy used in 4G reporting line reclassification. Ignore this hierarchy in this selection.

For example, if the LRM – Legal Entity is selected as Organization Structure, in the Application Preferences as shown in the following figure,




The selected Organization Structure (LRM – Legal Entity) along with the aggregation dimension members appear under the Dimension Selection section in BAU window as shown in the following figure:

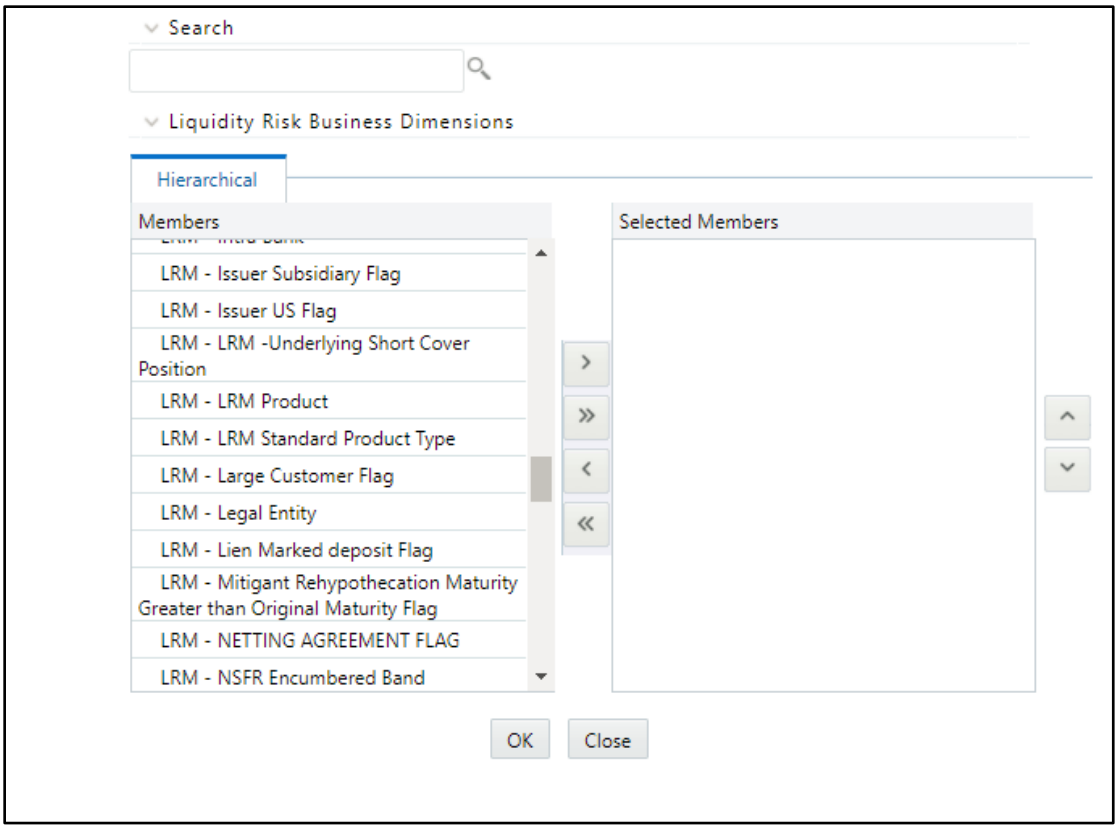



**Figure 7 Dimension Selection**

4. **Netting Agreement Flag**:

   This dimension identifies whether the derivative contract is part of netting agreement. Based on this flag, the net derivative cash inflow/out flows are determined. Hierarchy selection is not required for this dimension.

5. **Non-Contractual Obligation Type**:

   This dimension identifies the non-contractual obligations part of LRM Instrument table.

6. **Product:**

   For Product, there are two hierarchies present in out-of-box,

   LRM – Product: This is a single level hierarchy which lists all the products at the lowest level. This is default selection OOB.

   LRM – Product Balance Sheet Category: This is a five level hierarchy describing the higher levels of the products.

7. **Standard Product**:

   For Standard Product, only one hierarchy is present. LRM – Standard Product Type is automatically selected in the Standard Product field.

   The mandatory dimensions selected as part of this section appear in the dimension browser to support liquidity risk calculations.

## 3.5 Aggregation Dimension Selection

The aggregation dimension selection is done in order to aggregate the cash flows for business assumption application. All cash flows will be aggregated on the basis of Aggregation Dimension Selection. For example, if you require cash flows to be aggregated at a very high level, you can select lesser number of dimensions. In case, you require cash flows to be aggregated at a very granular, then all dimensions are selected. Further, the business assumption works on the dimensions selected and is restricted to the dimensions selected in this particular selection.

The application preferences made in this field are displayed in the BAU window under the Dimension browser. You are allowed to select the required dimension. For a detailed list of dimensions refer Annexure: Functional Details, section A. Data Flow and Dimensions

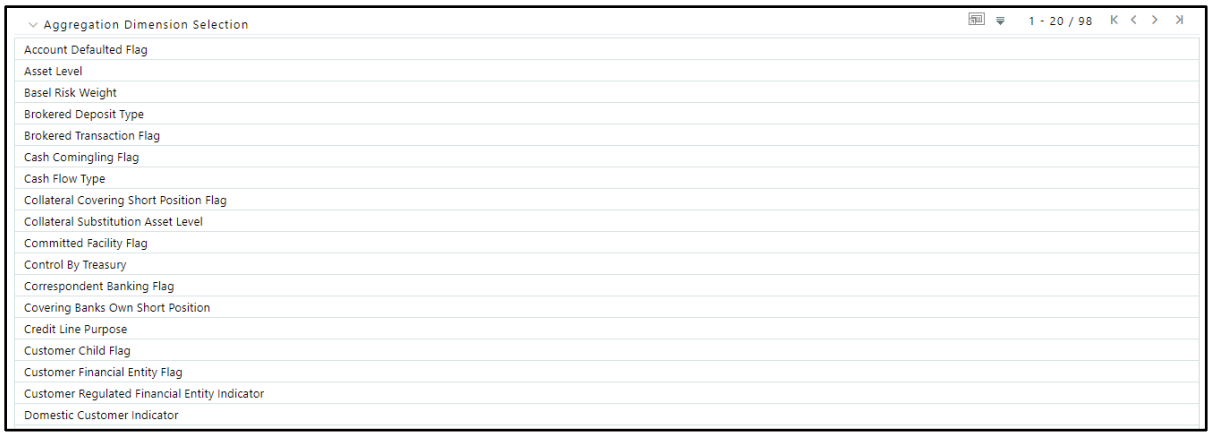
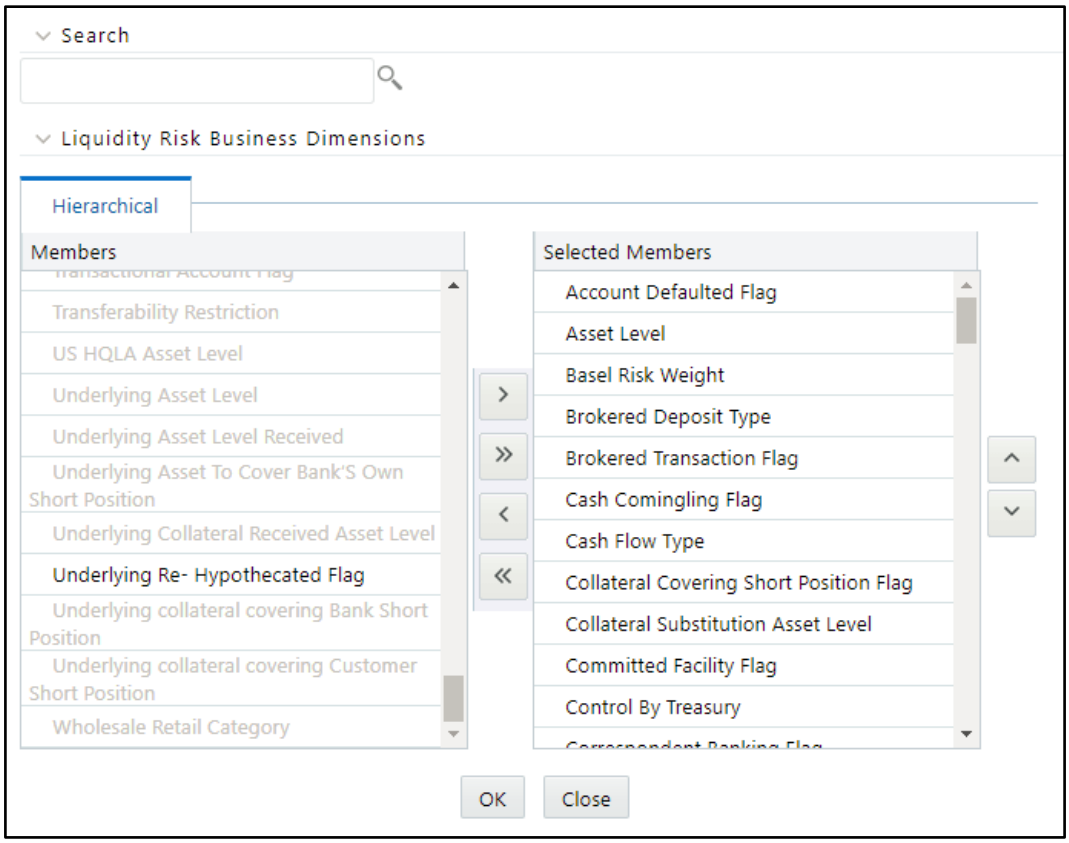



**Figure 8 Aggregation Dimension Selection**

To select the required dimensions, perform the following steps:

1. In the Application Preferences window, under Aggregation Dimension Selection, click  to select the members. The browser is displayed.

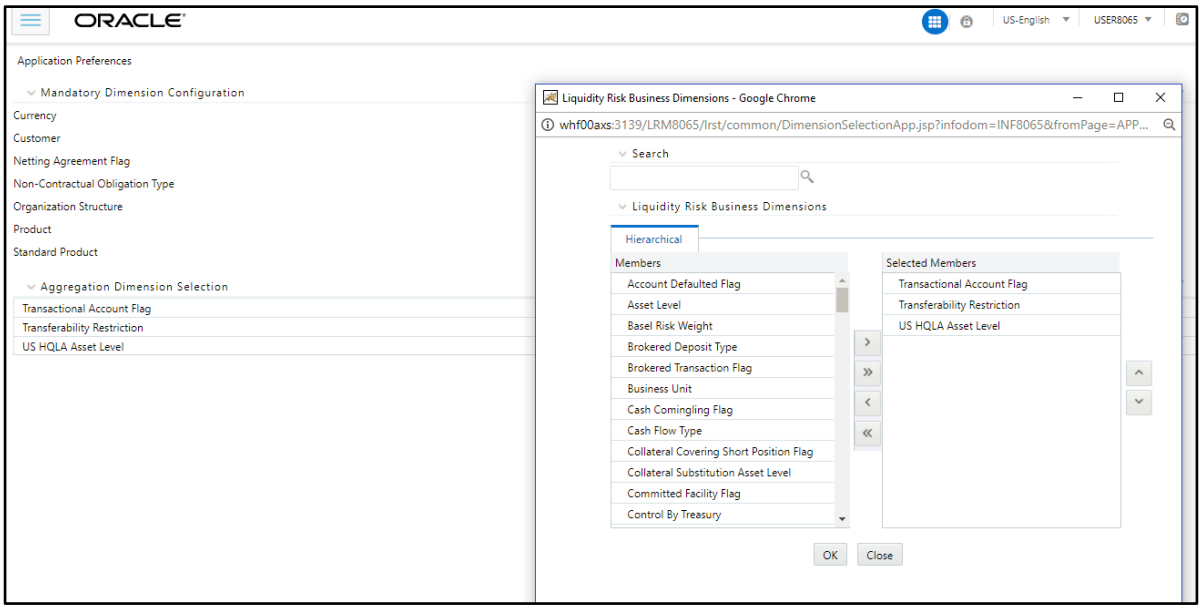



2. Select the required members.
3. Click  to move the selected items to Selected Members section, or click  to select all members.
4. Using  up or down arrows, you can sequence the dimensions.
5. Click **OK** to complete the selection.
6. To save the selection, click **Save** and use it for liquidity risk calculations.

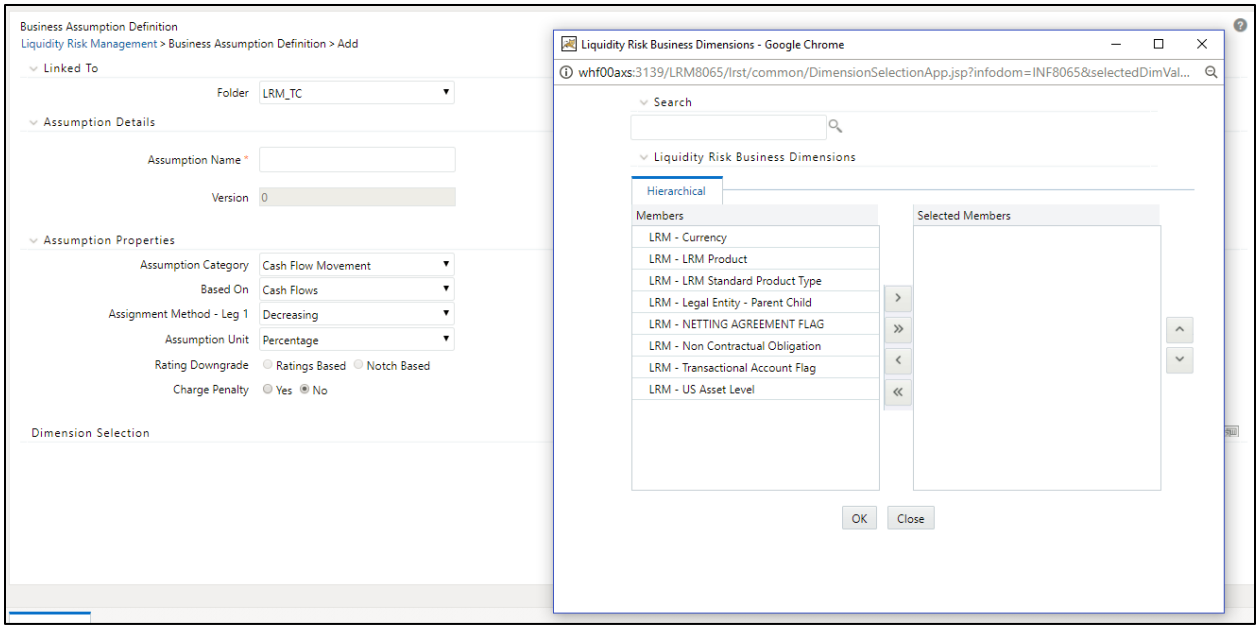
Only the selected dimensions appear under the Dimension browser in BAU window.

**NOTE:** To achieve better performance results, it is recommended to use just as many aggregation dimensions as is needed by the user.

For example, in the following window only three members are selected in the application preferences dimension browser.




Only the selected aggregation dimensions along with the mandatory dimensions appear under the Dimension Selection section in the Business Assumption window as shown in the following figure:




**Note**:

To add a new mandatory or aggregation dimension it is recommended to add the following seeded data in FSI_LRM_BUSINESS_DIMENSION and fsi_lrm_lookup_tl with Category ID 25:

- f_is_intraday_specific = 'Y'

  This dimension is used only for intraday Run and it is not displayed in Application Preference window. The f_selection_flag must be 'N' in this case as the US LCR Run must not me impacted.

- f_lcr_intraday_flag = 'Y'

  This dimension is used for both intraday and US LCR Run. This is displayed in Application Preference window.

- f_account_dimension = 'Y'

  This dimension is an account level attribute and is used only for intraday assumptions. This is displayed in Application Preference window.

- f_transaction_dimension = 'Y'

  This dimension is a transaction level attribute and is used only for intraday assumptions. This is displayed in Application Preference window.

**NOTE:** While adding new business dimensions, it is recommended to add dimensions with a small range of values. Adding dimensions with large set of values such as account, party, date will defeat the purpose of aggregation of cash flows and affects the performance.

The application currently supports the following dimensions for Asset Level classification:

1. **Asset Level**:
   This dimension is used for specifying business assumptions and classifying assets as HQLA as per guidelines other than US Federal Reserve.
2. **US Asset Level**:

   This dimension is used for specifying business assumptions and classifying assets as HQLA as per US Federal Reserve guidelines.

Both the dimensions are available for selection as part of the Aggregate Dimension selection section of the Application Preferences window. However, only one must be selected at a particular time.

For instance, if you wish to define an assumption or execute a Run with the Run Purpose "Basel III Liquidity Ratios Calculation" or "RBI Basel III Liquidity Ratio Calculation", select the dimension named Asset Level. If you wish to execute a Run with the Run Purpose "U.S. Fed Liquidity Ratio Calculation", you need to select the dimension named US Asset Level.

Once a particular Run is executed after selection of the appropriate asset level dimensions, you must not change the asset level dimension till that Run is executed; else it results in an error.

# 4 Holiday Calendar

This chapter discusses the procedure for creating a Holiday Calendar and generating a list of weekend and holiday dates.

## 4.1 Overview of Holiday Calendar

A Holiday is a day designated as having special significance for which individuals, a government, or some religious groups have deemed that observance is warranted and thus no business is carried on this day. The Holiday Calendar code can range from 1 to 99999.

The procedure for working with and managing a Holiday Calendar is similar to that of other OFSAA business rules. It includes the following steps:

- Searching for a Holiday Calendar.
- Viewing and Updating a Holiday Calendar.
- Copying a Holiday Calendar.
- Deleting a Holiday Calendar.
- Check Dependencies in the Holiday Calendar definitions.
- Refresh the Holiday Calendar summary page.

**NOTE:** Check Dependencies functionality is not supported for OFS LRM 8.0.4.

## 4.2 Searching for a Holiday Calendar

Search for a Holiday Calendar to perform any of the following tasks:

- View
- Edit
- Copy
- Delete
- Check Dependencies
- Refresh

### 4.2.1 Prerequisites

Predefined Holiday Calendar

### 4.2.2 Procedure

1. In **Oracle Financial Services Analytical Applications Infrastructure** home screen select, **Financial Services Liquidity Risk Management**.

2. To open the **Holiday Calendar** window, choose **Liquidity Risk Management** > **Holiday Calendar** on the Left-Hand Side (LHS) menu.

   This page is the gateway to all Holiday Calendars and related functionality. You can navigate to other pages relating to Holiday Calendar from this page.

3. Enter the Search criteria.

   - Enter the name of the Holiday Calendar.
   - Click the Search icon.

   Only holiday calendars that match the search criteria are displayed.

**NOTE:** You can control the number of rows to display on screen by selecting the "**Pagination Options**" icon from the action bar.

## 4.3 Creating a Holiday Calendar

You create holiday calendars to capture holidays for a given date range for any organization. It is possible to create and use multiple holiday calendars.

### 4.3.1 Procedure

1. In **Oracle Financial Services Analytical Applications Infrastructure** home screen select, **Financial Services Liquidity Risk Management**.
2. To open the **Holiday Calendar** window, choose **Liquidity Risk Management** > **Holiday Calendar** on the Left-Hand Side (LHS) menu.
3. Click Add Holiday Calendar. The Holiday Calendar details page is displayed.
4. Enter a code value for the new holiday calendar.

   **Note**: The code is a numeric identifier for the holiday calendar. The code value must be a number between 1 and 99999. The code value you assign to the new holiday calendar must be unique.

5. Enter the name and a brief description for the holiday calendar.

   **Note**: The name you assign to the holiday calendar must be unique. Name can hold a maximum of 30 characters.

6. In the Holiday Properties grid, select not more than two weekend days. Then choose the Holiday Period. The Holiday Period can be defined for a range of up to 40 years less than the current date and 40 years greater than the current date, totally spanning a maximum of 80 years.
7. In the Holiday Details grid, define the Holiday details for the any period within the holiday range defined in step 6. There are two types of holidays that can be defined, Fixed and Moving.

   A fixed holiday is one which is deemed as a holiday for every year in the holiday period, for that particular day.

   **Example** 25th December – Christmas, is a fixed holiday.

   **Note**: To define a fixed holiday, input the holiday date for the first occurrence in the date range. For example, if your Date Range runs from 01-JAN-2000 to 31-DEC-2050, you should input the

fixed holiday, Christmas, as 25-DEC-2000. The holiday calendar procedure will populate all subsequent 25-DEC entries in the holiday list table (FSI Holiday List).

The holiday calendar procedure will also ensure that holiday and weekend entries are not duplicated. For example, if weekends are defined as Saturday/Sunday and Christmas falls on a weekend day, there will be only one entry in the FSI Holiday List table.

A moving holiday is one which is deemed as a holiday only for that particular date and year, and not for every year in the holiday period. All occurrences of a moving holiday must be input manually.

**Example** 20th August 2012 is a moving holiday on account of the Muslim festival, Ramzan.

8. Once the holiday calendar definition is saved, its status in the summary page is marked as defined.
9. A holiday calendar created can also be deleted. Select one or more rows of holiday calendar definitions and click the Delete control.

### 4.3.2 Excel Import / Export

Excel import/export functionality is used for adding/editing holiday calendar definitions.

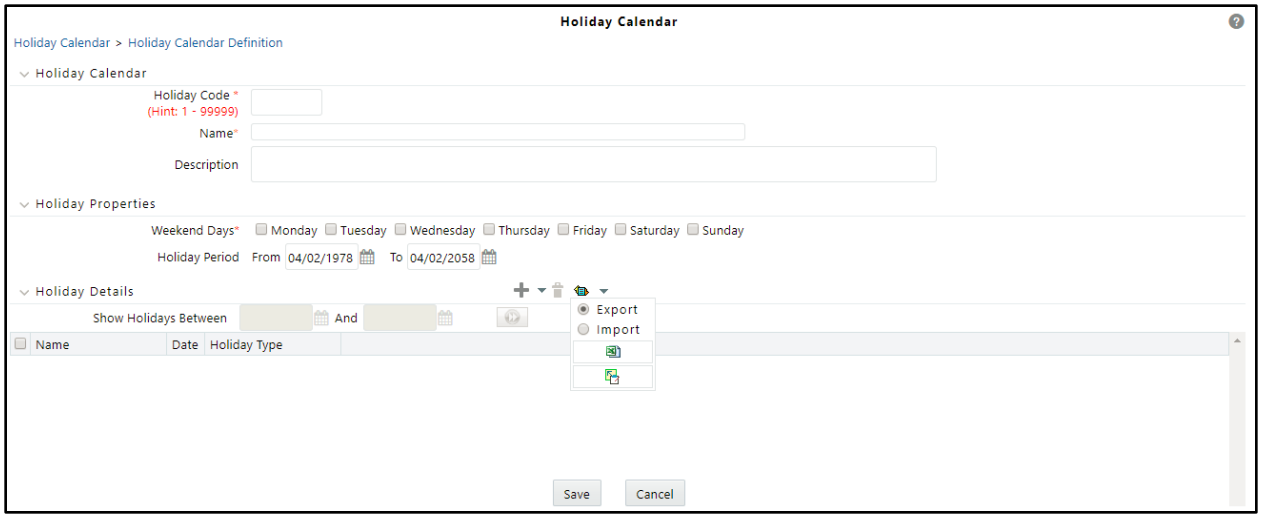



**Figure 9 Holiday Calendar – Excel Import / Export**

## 4.4 Executing Holiday Calendar

You execute a holiday calendar definition to generate calendar dates listing the various types of holidays for a given holiday period.

### 4.4.1 Prerequisites

Predefined Rules

### 4.4.2 Procedure

1. In **Oracle Financial Services Analytical Applications Infrastructure** home screen select, **Financial Services Liquidity Risk Management**.
2. To open the **Holiday Calendar** window, choose **Liquidity Risk Management** > **Holiday Calendar** on the Left-Hand Side (LHS) menu.
3. Search for a rule.
4. Select a Holiday Calendar and Click the Generate Calendar Dates icon to execute the selected holiday calendar. Holiday list for holiday ID #1 generated successfully message appears (where #1 is the holiday calendar code). The holiday list can be confirmed by querying the FSI Holiday List table.

   The status of a holiday calendar where holiday dates have been generated displays as "processed" in the status column in the summary page.

   **Important**: In case you do not want to Generate Calendar dates immediately, you can select that particular holiday calendar anytime later from the summary page with its status defined, and then click the Generate Calendar Dates icon to execute the selected holiday calendar.
5. The generated holiday list is no longer valid if:
   I. There is a change in the definition of the holiday calendar.
   II. There is any update or modification to the Holiday Exceptions defined for that holiday calendar.

   In such a case, the user will get a message "This holiday calendar has been modified, Please generate the holiday list again" and the holiday calendar state will be changed to "Defined" until the holiday list is regenerated with new definition.

## 4.5 Holiday Exceptions

1. You can specify exceptions to holidays. As a prerequisite, a holiday calendar should have been properly defined and the status of the holiday calendar in the summary page should be ‘Processed’. Generating the holiday list will populate the holidays (weekends, fixed and moving) along with the working days. Then the Show Exceptions button is enabled in the detail page. Any changes in the holiday definition will disable the "Show Exceptions" button. The user must generate the holiday list again to define or view the exceptions.
2. Click Show Exceptions in the Holiday Exceptions grid. The Holiday Exceptions window opens.
3. The search block in the Exceptions page has 6 fields: From (Year), To (year), Fixed Holidays, Moving Holidays, Holiday Date and All Exceptions.

   From and To - Denotes the range of years which is a subset out of the holiday list generated, for which exceptions are required to be defined.
   I. Fixed Holidays – You can filter the list of holidays by the type of Fixed Holidays.
   II. Moving Holidays – You can filter the list of holidays by the type of Moving Holidays.
   III. Holiday Date – For a particular known holiday date, exceptions can be defined.

IV. All Exceptions - This checkbox when selected lists all the exceptions, if already defined, for the holidays within the From, To Date range.

The search result gives the list of all holidays based on the selection of the above search criteria fields.

4. In the Holiday Exceptions block, there are two types of exceptions that can be defined: Not a holiday and Shift to.

   Any holiday can be marked as not a holiday, in which case that day is removed from the Holiday List. If the dropdown in the exception type is selected as "Not a Holiday", then the "shift to" date picker field is disabled.

   **Example**

   Spring earlier considered as a holiday in the holiday calendar can be marked as Not a Holiday in the Exceptions Window. Further the user can write his comments or remarks in the Notes Text Box next to the Exception Type dropdown. Any holiday can be shifted to another day, in which case the earlier declared holiday is removed from the Holiday List, while the shifted to day is included as a holiday.

### 4.5.1 Excel Import/ Export

Excel import/export functionality is used for adding/editing holiday exceptions.

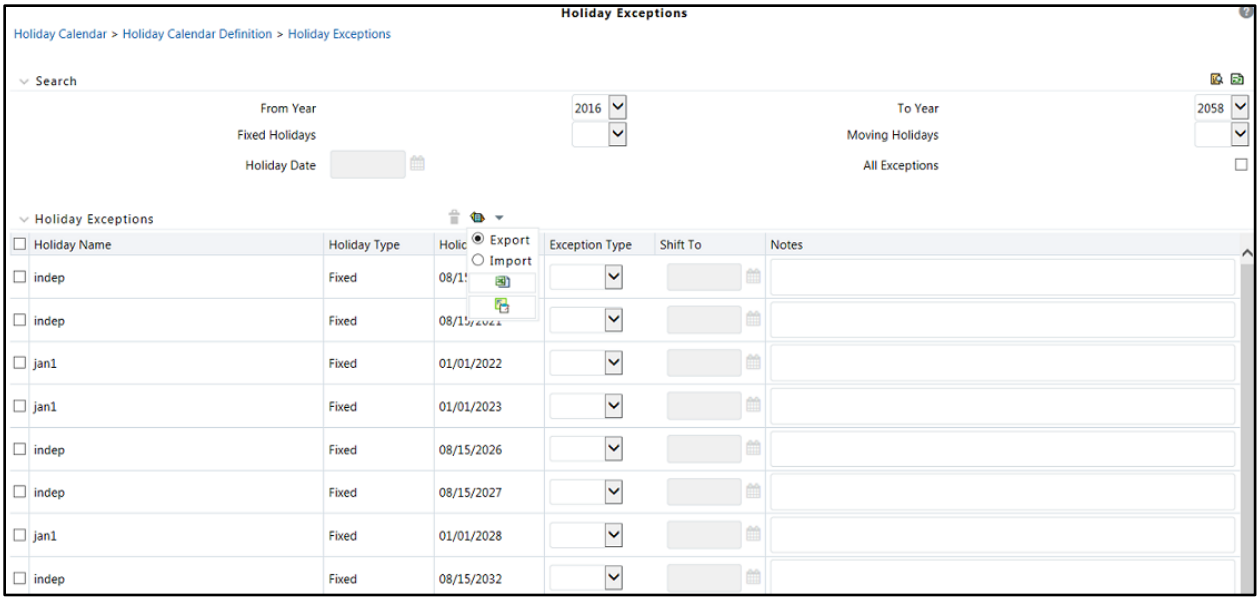



**Figure 10 Holiday Calendar - Holiday Exceptions**

**NOTE:** To use the holiday code configurations for LRM processing refer section Create/Execute LRM Batch from Command Line

# 5 Time Buckets

Time Bucketing is the process of allocating cash flows to defined time intervals to identify, measure, and manage liquidity risk. The purpose of time bucketing is to increase operational efficiency as it helps in processing and reporting efficiently. One of the preliminary steps in data preparation for the LRM processing is to bucket the cash flows into the time buckets which are defined. Since the basic functionality of ALM liquidity buckets and LRM liquidity buckets are the same, there is a provision for a common bucket definition for OFS ALM and OFS LRM applications.

## 5.1 Liquidity Buckets

### 5.1.1 Overview

The summary of the enhancements introduced in the Time Buckets module of the OFS LRM application are as follows:

- **Multiple time bucket definition**

  OFS LRM allows you to define multiple time bucket definitions and use them for different reporting purposes. For instance, FR 2052 a, FR 2052 b and LCR reporting requires time buckets of different granularities.

- **Additional bucket levels supported**

  OFS LRM supports 5 time bucket levels for each bucket definition. This is performed by grouping the level 0 buckets defined. There is a window to define multiple levels.

- **Reporting time bucket definition**

  OFS LRM allows you to define multiple reporting time buckets on a selected computational bucket definition. The Level 0 buckets of the computational and reporting time buckets are the same. The granularity of the other levels of reporting time buckets are different from that of the computational buckets. These are used for aggregating cash flows for reporting purposes. They are not used for defining business assumptions or for carrying out computations.

  In the Time Bucket summary window, there is an icon to define the reporting time bucket for the selected time bucket. When you click the icon, a new bucket definition screen appears with level 0 buckets same as the selected time bucket. You can define the name and higher levels through the new window.

- **Pre-configured LRM Time Buckets**

  The list of pre-packaged definitions is as follows:

  - FR 2052 b Reporting Buckets - This time bucket definition is used to address US Regulatory report - FR 2052 b

- FR 2052 a Reporting Buckets - This time bucket definition is used to address US Regulatory report - FR 2052 a
- LRM time bucket - This time bucket definition is used in OOB assumptions.

- **User specific time buckets**

  OFS ALM and OFS LRM users have access to their respective time bucket definitions only.

### 5.1.2 Liquidity Time Buckets Required for LRM Application

The default time buckets which are mandatorily required by the LRM application are as follows:

- **Open maturity time bucket** – All products which do not have a maturity associated with them are bucketed here. This is the time bucket used to bucket all cash flows that have an open maturity. This will be the first time bucket in the list. The start date and end date is not displayed for this time bucket. The start days and end days are set to -99999. These include products such as Current Account, Savings Account (CASA), and so on.
- **Overnight Bucket** - This will be the second time bucket in the list. The frequency and multiplier are 0 and days respectively. The start date and end date are set to as of date.
- **Unspecified bucket** - This is bucket where all cash flows that are not included in normal computations such as the delinquent cash flows which will not be recovered are moved. This bucket is provided to view these cash flows and not for calculation purpose. This is available at all bucket levels and will not have a time period associated with it. The unspecified bucket will be the last time bucket in the list. The start date and end date is not displayed for this time bucket. The start days and end days are set to 99999.

### 5.1.3 Inputs Required for Bucketing Cash Flows

The inputs required for bucketing cash flows are as follows:

- Defining time buckets.
- Cash flows and cash flow dates.
- Legal entity details of the account to which the cash flow relates.
- Legal entity specific holiday list.

### 5.1.4 Types of Liquidity Time Buckets

Oracle Financial Services Liquidity Risk Management supports multiple time bucket definitions.

Time bucket definitions are segregated into two types:

- Computational Time Buckets
- Reporting Time Buckets

#### 5.1.4.1 Computational Time Buckets

Computational time buckets are defined to enable business assumption definition and for the purpose of carrying out liquidity risk calculations. Multiple sets of computational buckets are supported with each set containing multiple time bucket levels. Users are allowed to define and maintain a library of such time bucket definitions and use it across business assumptions and Runs for satisfying the varied regulatory as well as management requirements.

Time buckets are defined in terms of days and displayed in hierarchical format. The definition of a day, whether business day or calendar day, will be a set-up parameter.

**Note**:

- There is no restriction on the number of bucket sets allowed to be defined.
- Number of bucket levels is restricted to 5 for a given computational bucket set.
- You are allowed to provide bucket names for all bucket levels other than level 0. Level 0 bucket names will be displayed as a combination of the start and end days as the bucket. For instance, 2 - 2 Day for a 1-day bucket starting on day 2.

  The example of Computational Time Bucket Definition 1 is as follows:

<table>
<tr><th>Level 2</th><th>Level 1</th><th>Level 0</th></tr>
<tr><td rowspan="5">1 Year</td><td rowspan="2">0 – 6 Months</td><td>0 – 3 Months</td></tr>
<tr><td>3 – 6 Months</td></tr>
<tr><td rowspan="3">6 – 12 Months</td><td>6 – 8 Months</td></tr>
<tr><td>8 – 10 Months</td></tr>
<tr><td>10 – 12 Months</td></tr>
</table>

**Table 3 Computational Time Bucket Definition Example 1**

The example of Computational Time Bucket Definition 2 is as follows:

| Level 2 | Level 1 | Level 0 |
|---|---|---|
| 1 Year | 1 – 3 Months | 0 – 1 Week |
| | | 1 – 4 Week |
| | | 1 – 3 Months |
| | 4 – 6 Months | 12 – 16 Weeks |
| | | 4 – 6 Months |
| | 7 – 12 Months | 6 – 9 Months |
| | | 9 – 12Months |

**Table 4 Computational Time Bucket Definition Example 2**

#### 5.1.4.2 Reporting Time Buckets

Reporting time buckets are defined over an existing computational time bucket set for the purpose of cash flow aggregation and reporting. This functionality allows liquidity gaps and cumulative gaps to be viewed across aggregation levels different from that of the computational bucket without re-executing the computations. This is enabled by ensuring that level 0 buckets of both the computational time buckets and the corresponding reporting time buckets are consistent.

In order to define a reporting time bucket set, Level 0 buckets of an existing computational time bucket set are obtained and are further grouped into multiple levels in case of computational buckets. Multiple reporting time bucket sets, consisting of multiple levels, are allowed to be defined for each computational time bucket set. The cash flows computed based on the contractual, baseline, or stress Runs are aggregated based on the reporting buckets and displayed in the ALM BI Analytics on selection of the relevant reporting bucket. Time buckets are to be displayed in hierarchical format.

**Note**:

- These buckets are used purely for aggregation and reporting purposes. Business assumptions are not allowed to be defined based on reporting time buckets.
- The computational bucket set is automatically saved as a reporting bucket set.
- The user is allowed to view the reporting bucket sets in the Metadata browser.
- There is no restriction on the number of reporting bucket sets defined based on a single computational bucket set.
- Number of bucket levels is restricted to 5 for a given reporting bucket set.

- You are allowed to provide bucket names for all bucket levels other than level 0. Level 0 bucket names will be displayed as a combination of the start and end days as the bucket name. For instance, 2 - 2 Day for a 1-day bucket starting on day 2.

The example of a reporting time bucket set 1 is as follows:

<table>
<tr><th colspan="4">Based on: Computational Time Bucket Set 2</th></tr>
<tr><th>Level 3</th><th>Level 2</th><th>Level 1</th><th>Level 0</th></tr>
<tr><td rowspan="6">0 – 1 Year</td><td rowspan="4">0 – 4 Months</td><td rowspan="2">0 – 4 Weeks</td><td>0 – 1 Week</td></tr>
<tr><td>1 – 4 Week</td></tr>
<tr><td rowspan="2">1 – 4 Months</td><td>1 – 3 Months</td></tr>
<tr><td>12 – 16 Weeks</td></tr>
<tr><td rowspan="2">4 – 12 Months</td><td>4 – 6 Months</td><td>4 – 6 Months</td></tr>
<tr><td rowspan="2">6 – 12 Months</td><td>6 – 9 Months</td></tr>
<tr><td>9 – 12Months</td></tr>
</table>

**Table 5 Reporting Time Bucket Set Example 1**

The example of a reporting time bucket set 2 is as follows:

<table>
<tr><th colspan="3">Based on: Computational Time Bucket Set 2</th></tr>
<tr><th>Level 2</th><th>Level 1</th><th>Level 0</th></tr>
<tr><td rowspan="6">0 – 1 Year</td><td>0 – 1 Weeks</td><td>0 – 1 Week</td></tr>
<tr><td rowspan="3">1 – 16 Weeks</td><td>1 – 4 Week</td></tr>
<tr><td>1 – 3 Months</td></tr>
<tr><td>12 – 16 Weeks</td></tr>
<tr><td rowspan="2">4 – 9 Months</td><td>4 – 6 Months</td></tr>
<tr><td>6 – 9 Months</td></tr>
<tr><td>9 – 12 Months</td><td>9 – 12 Months</td></tr>
</table>

**Table 6 Reporting Time Bucket Set Example 2**

### 5.1.5 Time Bucketing Process Flow

Time bucket definitions are uploaded in the Dimension Result Bucket table.

Once time buckets are uploaded, they can be viewed in the Time Buckets window in LRM application.

The process flow for Time Bucketing is as follows:

1. Calculate the number of holidays between the execution date and cash flow date.
2. Calculate number of business days for a cash flow on the basis of cash flow date and holidays.
3. Assign the cash flow to the time buckets on the basis of the business days.

### 5.1.6 Defining a New Time Bucket

1. In **Oracle Financial Services Analytical Applications Infrastructure** home screen select, **Financial Services Liquidity Risk Management**.
2. To open the **Time Buckets** window, choose **Liquidity Risk Management** >**Time Buckets** on the Left-Hand Side (LHS) menu.
3. Click the + button.

The Time Bucket Details – New window is displayed, perform the following steps:

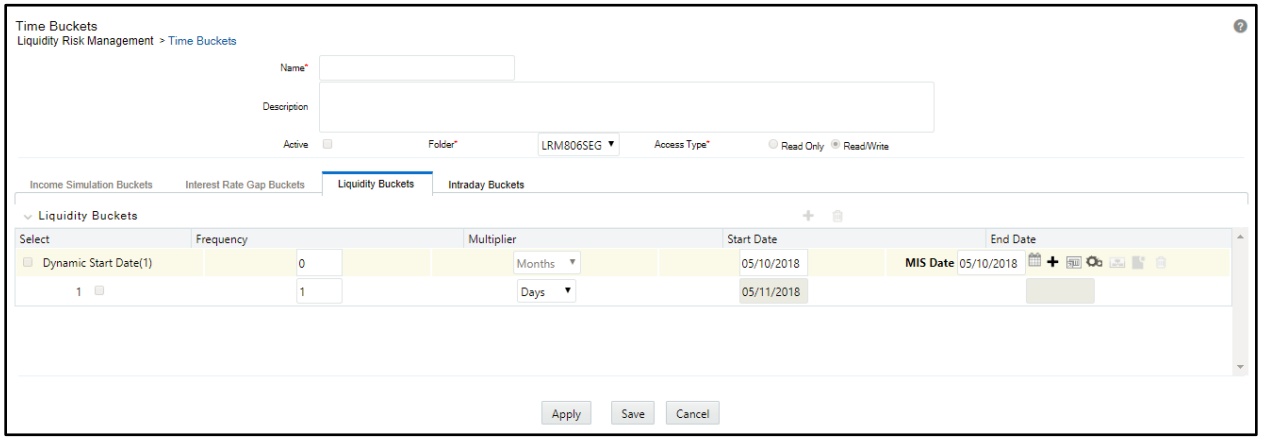



**Figure 11 Time Bucket**

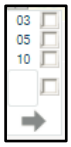
4. Enter the time bucket definition Name.
5. Enter the time bucket **Description**.

   **Note**: Active option and dynamic start date selection is disabled for LRM users.
6. Select the **Folder** from the drop-down list.
7. Define the **Frequency** (number of days) and **Multiplier** (Dates/Months/Years).

   **Note**: The time buckets tab name must be Liquidity Buckets for the purpose of defining time buckets used in LRM.

8. Click the icon to select the Start Date from the MIS Date format.
9. You are allowed to add the bucket rows in the following ways:
   a. Click + icon to add individual bucket rows and specify the frequency and multiplier.

      Or,

   b. Add multiple bucket rows by clicking icon. Clicking the icon displays 

where you can select 3, 5 or 10 pre-specified bucket rows to be added or add a custom number of rows by specifying the number and clicking . In this case, frequency and multiplier must be specified by the user individually for each bucket row added.

      Or,

   c. Specify multiple time buckets of varying lengths by clicking icon. Clicking the icon opens up a window that allows you to specify multiple time buckets in a single instance as a combination of number of buckets, frequency and multiplier as illustrated below.

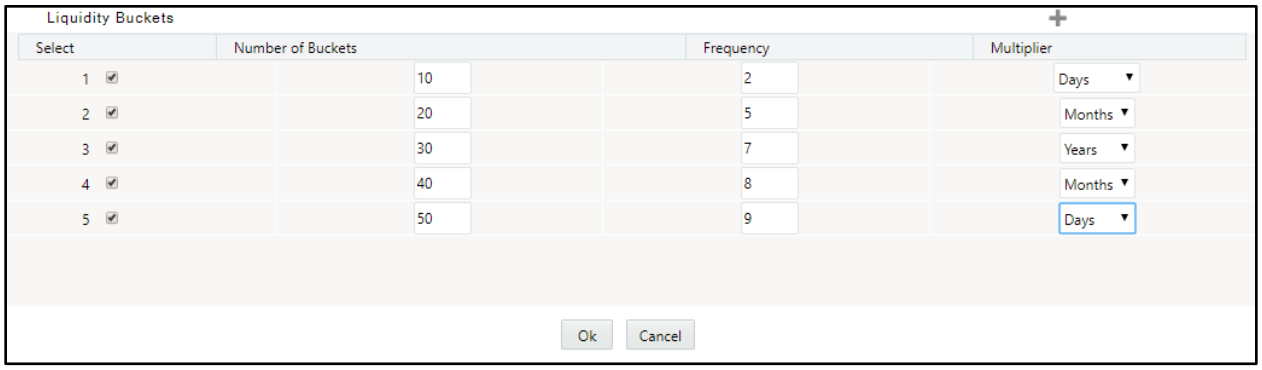



**Figure 12 Time Bucket Liquidity Buckets**

Click the + icon to add new rows. Each row allows you to specify the number of buckets of a particular size to be generated. In the above example, you can define 10 one day buckets by specifying the number of buckets as 10, the bucket size frequency as 2 and bucket size multiplier as 'days'. The application automatically generates 10 rows of time buckets, each with a bucket size of 2 days as part of the level 0 bucket definition.

10. Click **OK**. The application saves the bucket definition and the defined time bucket appears in the time bucket summary window.

    Once you define Level 0 time buckets, you are allowed to create multiple levels for this definition up to a maximum of 5 levels inclusive of level 0 buckets. This is optional. The time bucket definition is still saved with one level.

11. Once you define Level 0 time buckets, to define multiple bucket levels click **Apply**. The Time Bucket Grouping icon is now enabled to create less granular time bucket levels.
12. Click icon. The Liquidity Bucket Grouping window is displayed.

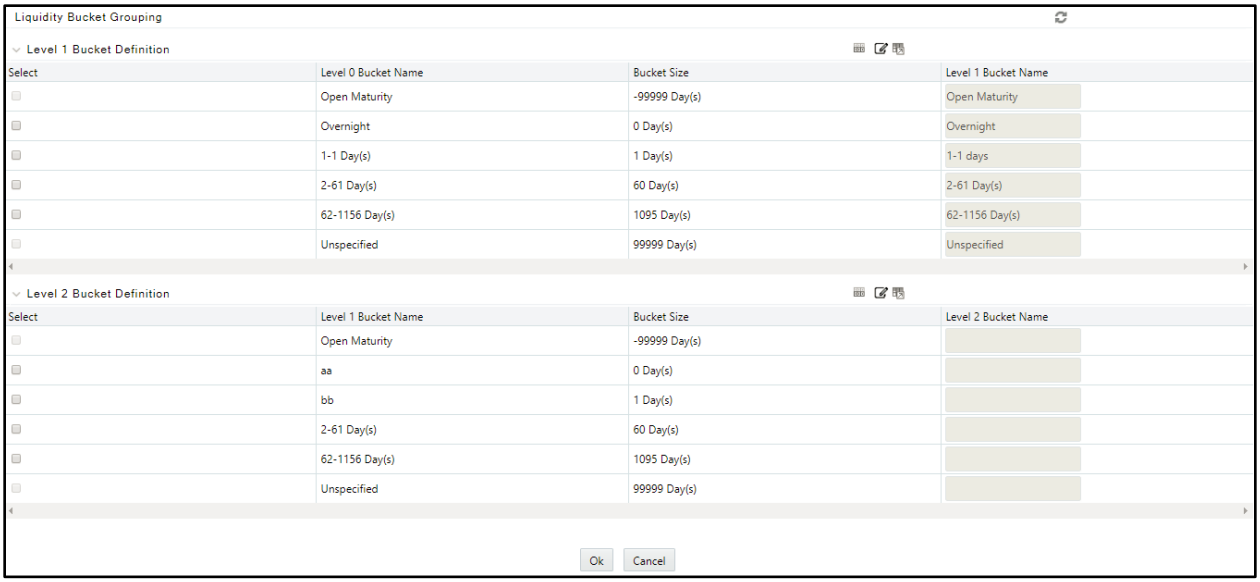



**Figure 13 Liquidity Bucket Grouping**

13. Click against a time bucket and click to group the time buckets. You can select multiple time buckets which form a single higher level bucket at a single instance by clicking the last time bucket. A dialog box is displayed to define the Level 1 Bucket name that is, a user-specified name for the higher level time bucket is created.
14. Enter the Node Name and then click **OK**. Repeat steps 10 and 11 to group the other level 0 buckets into level 1 bucket.
15. Click icon to reset all the levels defined for the time bucket definition.
16. Once all level 0 buckets are grouped, click the icon to save the grouping. On clicking the icon, the level 1 grouping is displayed in a new section named Level 2 Bucket Definition.

    The process of grouping level 1 bucket to level 2 buckets is similar to that detailed in points 10 through 12.
17. Once you have defined your multi-level time buckets, click **OK** to save the definition. The hierarchy for the specified time bucket definition is now created and can be used for further computations.

**NOTE:**

The application supports up to 5 levels.

Multi-level time bucket definition is optional. Users are allowed to save the time bucket with level less than or equal to 5.

You cannot modify an intraday bucket to a liquidity bucket or vice-versa. You can only define one bucket at a time.

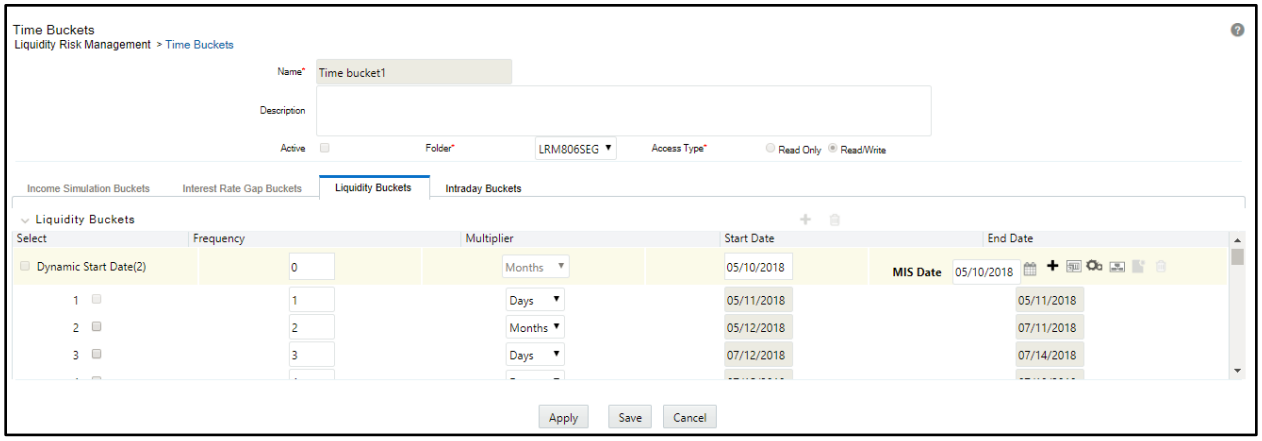
### 5.1.7 Creating Reporting Bucket

The Time Bucket definition screen allows you to define multi-level time buckets. Reporting time buckets are defined over an existing computational time bucket set.

To create a reporting bucket, perform the following steps:

1. On the **Oracle Financial Services Analytical Applications Infrastructure** window under **Time Bucket Summary** window, select a Computational Time Bucket already created and then click icon to create a reporting bucket.

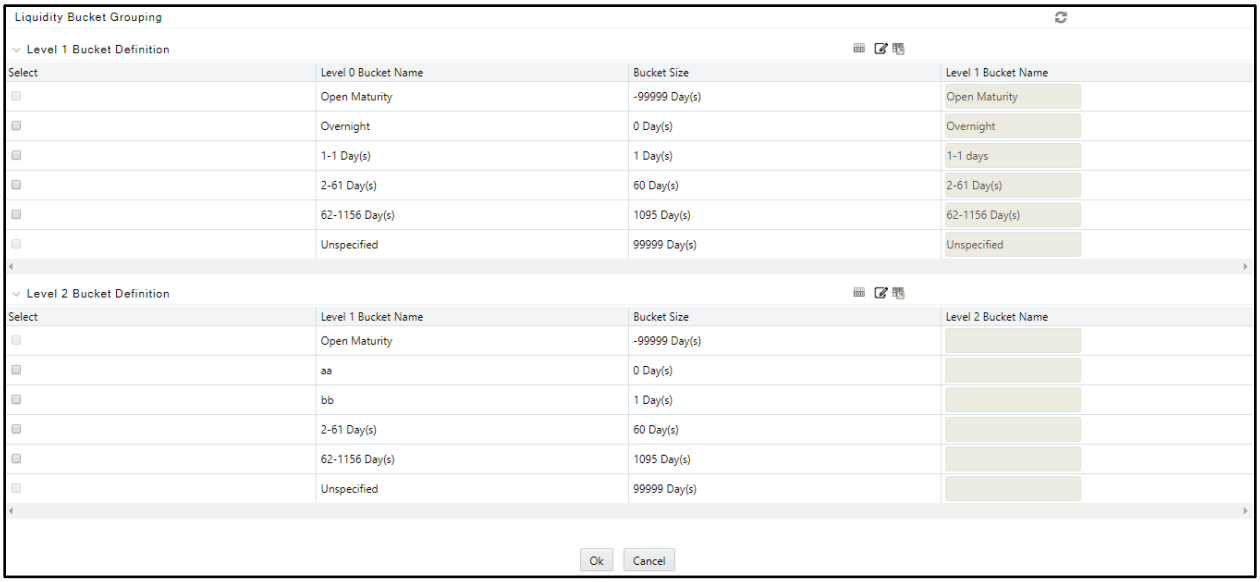
   The Time Bucket Details – Edit window is displayed.




2. Enter the time bucket **Name**.
3. Enter the time bucket **Description**.

   **Note**: Active option and dynamic start date selection is disabled for LRM users.
4. Select the **Folder** from the drop-down list.
5. Under Liquidity Buckets section, the level 0 buckets defined as part of the selected computational bucket are displayed.
6. Click the icon to select the Start Date from the MIS Date format.
7. In order to group, click **Apply**. The Time Bucket Grouping icon is now enabled to group different levels. Only the Level 0 buckets defined in computational time bucket are displayed. Hence you must define new higher levels. It is possible to group up to 5 levels. Once the grouping is done you can save it.
8. Click icon. The Time Bucket Grouping window is displayed.

   The process of grouping more granular buckets in higher level buckets is consistent for all bucket levels.




9. Click ☑ against a time bucket and click ✚ to group the time buckets. You can select multiple time buckets which form a single higher level bucket at a single instance by clicking the last time bucket. A dialog box is displayed to define the Level 1 Bucket name that is, a user-specified name for the higher level time bucket is created.
10. Enter the Node Name and then click **OK**. Repeat steps 10 and 11 to group the other level 0 buckets into level 1 bucket.
11. Click ↻ icon to reset all the levels defined for the time bucket definition.
12. Once all level 0 buckets are grouped, click the ▦ icon to save the grouping. On clicking the ⧉ icon, the level 1 grouping is displayed in a new section named Level 2 Bucket Definition.

    The process of grouping level 1 bucket to level 2 buckets is similar to that detailed in points 10 through 12.
13. Once you have defined your multi-level time buckets, click **OK** to save the definition. The hierarchy for the specified time bucket definition is now created and can be used for further computations.

**Note**:

a. In case of all bucket types you are allowed to specify a bucket called Unspecified Bucket. This is available at all bucket levels and will not have a time period associated with it.

b. The Overnight bucket will be the second time bucket in the list. The frequency and multiplier are 0 and days respectively. The start date and end date are set to as of date.

c. Additionally, a time bucket called Open Maturity is present. This is the time bucket used to bucket all cash flows from accounts that have do not have a maturity associated with them.

d. On execution of a Run, the start and end date is stored against each time bucket. This is for reporting purpose only. All definitions will use bucket names.

## 5.2 Intraday Buckets

### 5.2.1 Overview

Intraday time buckets are used for intraday metrics calculation and reporting. The maximum duration of an Intraday bucket definition is 24 hours. Granularity of definition is in hours, minutes and seconds instead of days as in liquidity buckets.

**NOTE:** Intraday bucket is by default, a computational bucket. Reporting buckets are not a part of Intraday bucket definition.

### 5.2.2 Bucket Definition

An Intraday bucket definition can support a maximum of 24 hour interval of time buckets. This interval is defined by the Start Time and End Time which is taken as an input by the application. The Start and End time are referred to as the bucket limits. Within each level, there are numerous buckets spanning from the start time up to the end time. Up to five levels can be defined within a time bucket definition. Level 0 definition is mandatory for defining an intraday bucket definition.

The inputs required\rules for defining an intraday bucket are as follows:

1. In the Start Time and End Time field, you can enter the maximum start and end times of payment systems with reference to a legal entity. For example, if a legal entity has 3 payments systems with start time as follows:
    - Payment system 1: 09:00 to 17:00
    - Payment system 2: 00:00 to 13:00
    - Payment system 3:10:00 to 20:00.

    In this case, the from and to values are chosen as: 00:00 and 20:00.

    Only HH and MM are taken as an input. The seconds part is automatically added by the application and SS is always 00. In the above example; from and to values to be stored are 00:00:00 and 20:00:00.
2. The multiplier is in the form of Seconds, Minutes and Hours.
3. Uniform interval time buckets only can be defined. For every level, the frequency and multiplier chosen under that level applies to the entire duration of the bucket limits.
4. The number of buckets at each level is computed by the application based on the bucket limits, frequency and multiplier. For example: If bucket limits are 09:00 to 16:00 and level zero has frequency and multiplier of 1 second, then every second between 09:00:00 and 16:00:00 serves as one bucket.
5. The following are additional points which need to be considered before defining an intraday bucket:
    a. Maximum Frequency is 59 in case of seconds and minutes; and 23 in case of hours.

b. Frequency cannot be zero or fractions. Frequency must be a whole number greater than zero always.

c. Level 1 and the higher levels must be at a greater granularity than the underlying levels. The following must be considered before defining higher levels:

- Multiplier of a higher level must always be equal to or greater than multiplier at a lower level. This implies that if level zero is defined in minutes, then the higher levels can only be in minutes/hours. Dropdown values for multipliers in the higher level reflect the same.
- In case when multiplier between higher and lower levels are same, then it must be ensured that frequency of the higher level must be greater than the frequency of the lower level.
- The (frequency x multiplier) of the higher level must be a **whole multiple** of the (frequency x multiplier) of the lower level.
  - Example 1: Level 0= 1 second, Level 1 can be 5 seconds, 1 minute, 10 minutes and so on.
  - Example 2: If Level 0 =5 seconds, then level 1 can be 10 seconds, 15 seconds, 1 minute etc. Level 1 in this case cannot have values like 7 seconds, 8 seconds and so on.

### 5.2.3 Defining an Intraday Bucket

In the **Oracle Financial Services Analytical Applications Infrastructure** home screen select, **Financial Services Liquidity Risk Management**. To open the **Time Buckets** window, choose **Liquidity Risk Management** >**Time Buckets** on the Left-Hand Side (LHS) menu.

In the Time Bucket summary window, click ✚ icon to add an intraday bucket.

The **Time Bucket Details** window is displayed, perform the following steps:

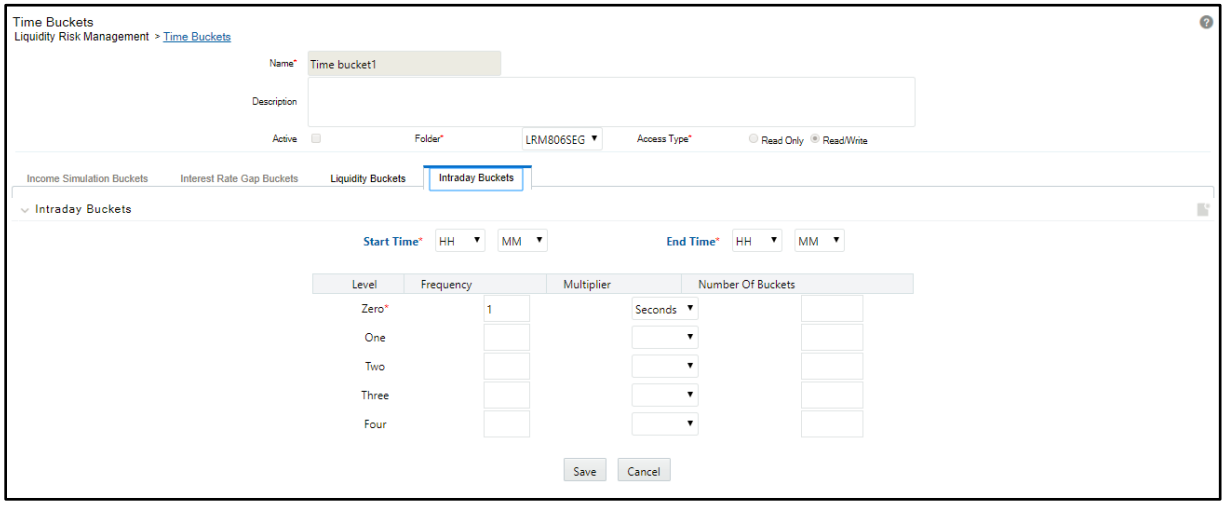



**Figure 14 Time Bucket**

1. Select the Intraday Buckets tab in the Time Buckets window.
   **Note**: By default, Liquidity Buckets tab is selected.
2. Enter the time bucket definition **Name**.
3. Enter the time bucket **Description**.

   **Note**: Active option is checked by default for LRM users.
4. Select the **Folder** from the drop-down list.
5. Define the Start Time and End Time based on the Bucket Definition provided.
6. Define the **Frequency** (a whole number greater than zero) and **Multiplier** (Seconds/Minutes/Hours).

   Once you define Level 0 time buckets, you are allowed to create multiple levels for this definition up to a maximum of 5 levels inclusive of level 0 buckets. Creating higher levels is optional.
7. Once you have defined your multi-level time buckets, click **Apply** and then **Save** the definition. The hierarchy for the specified time bucket definition is now created and can be used for further computations.
8. The application saves the bucket definition and the defined intraday bucket appears in the time bucket summary window.

**NOTE:**

The application supports up to 5 levels.

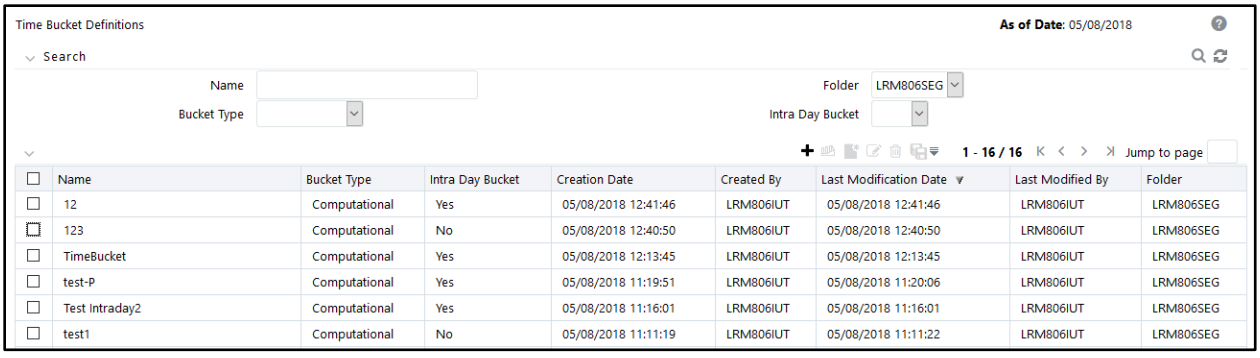
Multi-level time bucket definition is optional. Users are allowed to save the time bucket with level less than or equal to 5.

You cannot modify a liquidity bucket to an intraday bucket or vice-versa. You can only define one type of bucket at a time.

## 5.3 Understanding Time Buckets Summary

In **Oracle Financial Services Analytical Applications Infrastructure** under **Select Applications** select, **Financial Services Liquidity Risk Management**.

To open the Time Bucket Summary window, choose **Liquidity Risk Management** > **Time Bucket Summary** on the Left-Hand Side (LHS) menu.




| Name | Bucket Type | Intra Day Bucket | Creation Date | Created By | Last Modification Date | Last Modified By | Folder |
|---|---|---|---|---|---|---|---|
| 12 | Computational | Yes | 05/08/2018 12:41:46 | LRM806IUT | 05/08/2018 12:41:46 | LRM806IUT | LRM806SEG |
| 123 | Computational | No | 05/08/2018 12:40:50 | LRM806IUT | 05/08/2018 12:40:50 | LRM806IUT | LRM806SEG |
| TimeBucket | Computational | Yes | 05/08/2018 12:13:45 | LRM806IUT | 05/08/2018 12:13:45 | LRM806IUT | LRM806SEG |
| test-P | Computational | Yes | 05/08/2018 11:19:51 | LRM806IUT | 05/08/2018 11:20:06 | LRM806IUT | LRM806SEG |
| Test Intraday2 | Computational | Yes | 05/08/2018 11:16:01 | LRM806IUT | 05/08/2018 11:16:01 | LRM806IUT | LRM806SEG |
| test1 | Computational | No | 05/08/2018 11:11:19 | LRM806IUT | 05/08/2018 11:11:22 | LRM806IUT | LRM806SEG |

**Figure 15 Time Buckets Summary**

The Time Bucket Summary window displays the following fields. The definitions based on the search criteria are listed under list of Time Buckets.

This is the search section which contains multiple parameters. You can specify one or multiple search criteria in this section. When you click the search icon, depending up on the search criteria, this filters and displays the relevant search combination parameters under the Time Bucket summary as a list.

| **Search** | |
|---|---|
| **Field\Icon** | **Description** |
| Search  | This icon allows you to search the time buckets on the basis of the search criteria specified. Search criteria include a combination of the Time Bucket Name, Folder, and Bucket Type. The time bucket displayed in the list of time bucket table are filtered based on the search criteria specified on clicking of this icon. |
| Reset  | This icon allows you to reset the search section to its default state that is, without any selections. Resetting the search section displays all the existing time bucket definitions in the list of time buckets table. |
| Name | This field allows you to search the pre-defined time bucket definitions on the basis of the time bucket name. Enter the time bucket name. |
| Folder | This field allows you to search for the pre-defined time bucket definitions on the basis of the selected folder. This field displays a list of folders that you have access to as a drop-down. Selection of a folder from the drop down list displays only those time buckets that have been defined within the selected folder/segment in the List of Time Bucket table. |
| Bucket Type | This is a drop-down selection of one of the following options: Computation and Reporting. |
| Intra Day Bucket | This field allows you to search Intraday buckets, Non-intraday buckets and both. If a 'Yes' is chosen, only Intraday buckets are searched and displayed. If a 'No' is chosen, non- intraday buckets are searched and displayed. By not choosing this field in the search criteria, the Application searches and lists both Intraday and non-intraday buckets. |

**Table 7 Time Bucket - Search**

| List of Time Buckets | | |
|---|---|---|
| **Icon Name** | **Icon** | **Description** |
| Add |  | This icon allows you to define a new time bucket set. |
| Create Reporting Bucket |  | This icon opens the reporting time bucket window. The Level 0 buckets of the reporting time is same as the selected time bucket. |
| View |  | This icon allows you to view the selected time bucket definition. |
| Edit |  | This icon allows you to edit the selected time bucket definition. |
| Delete |  | This icon allows you to delete the selected time bucket definition. |
| Copy |  | The icon allows the selected definition to be copied and resaved as a new definition. |

**Table 8 Time Buckets Summary**

**NOTE:** It is not possible to switch from Intraday buckets to non-intraday buckets and vice versa from the Time Bucket summary window.

## 5.4 Cash Flow Bucketing

The application computes the time buckets based on two approaches:

- Calendar Days
- Business Days

The two aspects of Cash Flow Bucketing are as follows:

a. Time buckets are generated based on calendar days and business days on a daily basis

b. Cash flows are bucketed based on the time buckets

### 5.4.1 Calendar Days

Under the calendar days approach, the start and end date of each time bucket is computed based on the number of calendar days. The time bucket dates are in running calendar day sequence. The time bucket dates are consistent across multiple legal entities, each with different holidays.

The process of computing the time buckets based on **calendar days** and subsequent bucketing of cash flows based on each business day convention is illustrated below.

**1. Inputs**

a. **Cash Flows**

The following table illustrates the cash flows based on each date for legal entities 1 and 2.

| Date | Legal Entity 1 | | Legal Entity 2 | |
|---|---|---|---|---|
| | Inflow | Outflow | Inflow | Outflow |
| 1/28/2015 | 20 | 22 | 14 | 19 |
| 1/29/2015 | 11 | 29 | 15 | 27 |
| 1/30/2015 | 11 | 26 | 18 | 26 |
| 1/31/2015 | 22 | 22 | 23 | 10 |

| Date | Legal Entity 1 | | Legal Entity 2 | |
|---|---|---|---|---|
| | Inflow | Outflow | Inflow | Outflow |
| 2/1/2015 | 22 | 21 | 25 | 11 |
| 2/2/2015 | 24 | 18 | 26 | 14 |
| 2/3/2015 | 29 | 23 | 16 | 28 |
| 2/4/2015 | 30 | 21 | 26 | 22 |
| 2/5/2015 | 18 | 23 | 30 | 21 |
| 2/6/2015 | 11 | 22 | 23 | 26 |
| 2/7/2015 | 23 | 17 | 10 | 18 |
| 2/8/2015 | 28 | 29 | 24 | 19 |
| 2/9/2015 | 27 | 23 | 27 | 11 |
| 2/10/2015 | 23 | 18 | 23 | 21 |
| Total | 299 | 314 | 300 | 273 |

b. **Holiday Calendar**

The following table illustrates Holidays (including weekends) based on each date for legal entities 1 and 2.

| Legal Entity 1 | | Legal Entity 2 | |
|---|---|---|---|
| Date | Type | Date | Type |
| 1/31/2015 | Weekend | 1/30/2015 | Weekend |
| 2/1/2015 | Weekend | 1/31/2015 | Weekend |

| Legal Entity 1 | | Legal Entity 2 | |
|---|---|---|---|
| **Date** | **Type** | **Date** | **Type** |
| 2/4/2015 | Holiday | 2/6/2015 | Weekend |
| 2/7/2015 | Weekend | 2/7/2015 | Weekend |
| 2/8/2015 | Weekend | 2/10/2015 | Holiday |
| 2/14/2015 | Weekend | 2/13/2015 | Weekend |
| 2/15/2015 | Weekend | 2/14/2015 | Weekend |

c. **Time Bucket Definition**

The time bucket start and end date is calculated by each of the level 0 time buckets which are specified as part of the time bucket definition above.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Level 0 Buckets** | Open Maturity | Overnight | 1-1 Day | 2-2 Day | 3-3 Day | 4-4 Day | 5-5 Day | 6-6 Day | 7-7 Day | 8-14 Day | >14 Days |
| **Level 1 Bucket** | Open Maturity | Overnight | 1-5 Days | | | | | 6-14 Days | | | >14 Days |

d. **As of Date**

| | |
|---|---|
| **As of Date** | 1/27/2015 |

## 2. Calculation

a. **Time Bucket Start and End Date**

The following is an example of time bucket start and end date.

| Level 0 Bucket | Open Maturity | Overnight | 1-1 Day | 2-2 Day | 3-3 Day | 4-4 Day | 5-5 Day | 6-6 Day | 7-7 Day | 8-14 Day | >14 Days |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bucket Size (Days) | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 | |
| Start Date | | | 1/28/2015 | 1/29/2015 | 1/30/2015 | 1/31/2015 | 2/1/2015 | 2/2/2015 | 2/3/2015 | 2/4/2015 | 2/11/2015 |
| End Date | | | 1/28/2015 | 1/29/2015 | 1/30/2015 | 1/31/2015 | 2/1/2015 | 2/2/2015 | 2/3/2015 | 2/10/2015 | |

b. **Cash Flow Bucketing for Legal Entity 1**

The following is an example of cash flow bucketing under each Business Day Convention for legal entity 1:

| Time Buckets | | | Bucketing under each Business Day Convention | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Prior | | Conditional Prior | | Following | | Conditional Following | | No Adjustment | |
| Bucket Name | Start Date | End Date | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow |
| Open Maturity | | | | | | | | | | | | |
| Overnight | | | | | | | | | | | | |
| 1-1 Day | 1/28/2015 | 1/28/2015 | 20 | 22 | 20 | 22 | 20 | 22 | 20 | 22 | 20 | 22 |
| 2-2 Day | 1/29/2015 | 1/29/2015 | 11 | 29 | 11 | 29 | 11 | 29 | 11 | 29 | 11 | 29 |
| 3-3 Day | 1/30/2015 | 1/30/2015 | 55 | 69 | 11 | 26 | 11 | 26 | 55 | 69 | 11 | 26 |
| 4-4 Day | 1/31/2015 | 1/31/2015 | | | | | | | | | 22 | 22 |
| 5-5 Day | 2/1/2015 | 2/1/2015 | | | | | | | | | 22 | 21 |

| Time Buckets | | | Bucketing under each Business Day Convention | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Prior | | Conditional Prior | | Following | | Conditional Following | | No Adjustment | |
| Bucket Name | Start Date | End Date | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow |
| 6-6 Day | 2/2/2015 | 2/2/2015 | 24 | 18 | 68 | 61 | 68 | 61 | 24 | 18 | 24 | 18 |
| 7-7 Day | 2/3/2015 | 2/3/2015 | 59 | 44 | 29 | 23 | 29 | 23 | 29 | 23 | 29 | 23 |
| 8-14 Day | 2/4/2015 | 2/10/2015 | 130 | 132 | 160 | 153 | 160 | 153 | 160 | 153 | 160 | 153 |
| >14 Days | 2/11/2015 | | | | | | | | | | | |
| Total | | | 299 | 314 | 299 | 314 | 299 | 314 | 299 | 314 | 299 | 314 |

c. **Cash Flow Bucketing for Legal Entity 2**

The following is an example of cash flow bucketing under each Business Day Convention for legal entity 1:

| Time Buckets | | | Bucketing under each Business Day Convention | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Prior | | Conditional Prior | | Following | | Conditional Following | | No Adjustment | |
| Bucket Name | Start Date | End Date | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow |
| Open Maturity | | | | | | | | | | | | |
| Overnight | | | | | | | | | | | | |
| 1-1 Day | 1/28/2015 | 1/28/2015 | 14 | 19 | 14 | 19 | 14 | 19 | 14 | 19 | 14 | 19 |
| 2-2 Day | 1/29/2015 | 1/29/2015 | 56 | 63 | 15 | 27 | 15 | 27 | 56 | 63 | 15 | 27 |
| 3-3 Day | 1/30/2015 | 1/30/2015 | | | | | | | | | 18 | 26 |
| 4-4 Day | 1/31/2015 | 1/31/2015 | | | | | | | | | 23 | 10 |
| 5-5 Day | 2/1/2015 | 2/1/2015 | 25 | 11 | 66 | 47 | 66 | 47 | 25 | 11 | 25 | 11 |
| 6-6 Day | 2/2/2015 | 2/2/2015 | 26 | 14 | 26 | 14 | 26 | 14 | 26 | 14 | 26 | 14 |
| 7-7 Day | 2/3/2015 | 2/3/2015 | 16 | 28 | 16 | 28 | 16 | 28 | 16 | 28 | 16 | 28 |
| 8-14 Day | 2/4/2015 | 2/10/2015 | 163 | 138 | 163 | 138 | 140 | 117 | 163 | 138 | 163 | 138 |
| >14 Days | 2/11/2015 | | | | | | 23 | 21 | | | | |
| Total | | | 300 | 273 | 300 | 273 | 300 | 273 | 300 | 273 | 300 | 273 |

### 5.4.2 Business Days

Under the business days approach, the start and end date of each time bucket is computed based on the number of business days. The time bucket dates are not continuous calendar days in this approach but will exclude holidays. The time bucket dates will be different for each legal entity based on its respective holiday calendar.

The process of computing the time buckets based on **business days** and subsequent bucketing of cash flows based on each business day convention is illustrated below.

1. **Input**

   For **Input** data refer to the Calendar Days approach.

2. **Calculation**

   a. **Time Bucket Start and End Date for Legal Entity 1**

   The following is an example of time bucket stand and end date for legal entity 1.

| Level 0 Bucket | Open Maturity | Overnight | 1-1 Day | 2-2 Day | 3-3 Day | 4-4 Day | 5-5 Day | 6-6 Day | 7-7 Day | 8-14 Day | >14 Days |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bucket Size (Days) | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 | |
| Start Date | | | 1/28/2015 | 1/29/2015 | 1/30/2015 | 2/2/2015 | 2/3/2015 | 2/5/2015 | 2/6/2015 | 2/9/2015 | 2/18/2015 |
| End Date | | | 1/28/2015 | 1/29/2015 | 1/30/2015 | 2/2/2015 | 2/3/2015 | 2/5/2015 | 2/6/2015 | 2/17/2015 | |

b. **Time Bucket Start and End Date for Legal Entity 2**

The following is an example of time bucket stand and end date for legal entity 2.

| Level 0 Bucket | Open Maturity | Overnight | 1-1 Day | 2-2 Day | 3-3 Day | 4-4 Day | 5-5 Day | 6-6 Day | 7-7 Day | 8-14 Day | >14 Days |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bucket Size (Days) | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 | |

| Level 0 Bucket | Open Maturity | Overnight | 1-1 Day | 2-2 Day | 3-3 Day | 4-4 Day | 5-5 Day | 6-6 Day | 7-7 Day | 8-14 Day | >14 Days |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Date | | | 1/28/2015 | 1/29/2015 | 2/1/2015 | 2/2/2015 | 2/3/2015 | 2/4/2015 | 2/5/2015 | 2/8/2015 | 2/18/2015 |
| End Date | | | 1/28/2015 | 1/29/2015 | 2/1/2015 | 2/2/2015 | 2/3/2015 | 2/4/2015 | 2/5/2015 | 2/17/2015 | |

c. **Cash Flow Bucketing for Legal Entity 1**

The following is an example of cash flow bucketing under each Business Day Convention for legal entity 1:

| Time Buckets | | | Bucketing under each Business Day Convention | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Prior | | Conditional Prior | | Following | | Conditional Following | |
| Bucket Name | Start Date | End Date | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow |
| Open Maturity | | | | | | | | | | |
| Overnight | | | | | | | | | | |
| 1-1 Day | 1/28/2015 | 1/28/2015 | 20 | 22 | 20 | 22 | 20 | 22 | 20 | 22 |
| 2-2 Day | 1/29/2015 | 1/29/2015 | 11 | 29 | 11 | 29 | 11 | 29 | 11 | 29 |
| 3-3 Day | 1/30/2015 | 1/30/2015 | 55 | 69 | 11 | 26 | 11 | 26 | 55 | 69 |
| 4-4 Day | 2/2/2015 | 2/2/2015 | 24 | 18 | 68 | 61 | 68 | 61 | 24 | 18 |
| 5-5 Day | 2/3/2015 | 2/3/2015 | 59 | 44 | 29 | 23 | 29 | 23 | 59 | 44 |
| 6-6 Day | 2/5/2015 | 2/5/2015 | 18 | 23 | 48 | 44 | 48 | 44 | 18 | 23 |

| Time Buckets | | | Bucketing under each Business Day Convention | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Prior | | Conditional Prior | | Following | | Conditional Following | |
| Bucket Name | Start Date | End Date | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow |
| 7-7 Day | 2/6/2015 | 2/6/2015 | 62 | 68 | 11 | 22 | 11 | 22 | 62 | 68 |
| 8-14 Day | 2/9/2015 | 2/17/2015 | 50 | 41 | 101 | 87 | 101 | 87 | 50 | 41 |
| >14 Days | 2/18/2015 | | | | | | | | | |
| Total | | | 299 | 314 | 299 | 314 | 299 | 314 | 299 | 314 |

d. **Cash Flow Bucketing for Legal Entity 2**

The following is an example of cash flow bucketing under each Business Day Convention for legal entity 2:

| Time Buckets | | | Bucketing under each Business Day Convention | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Prior | | Conditional Prior | | Following | | Conditional Following | |
| Bucket Name | Start Date | End Date | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow |
| Open Maturity | | | | | | | | | | |
| Overnight | | | | | | | | | | |
| 1-1 Day | 1/28/2015 | 1/28/2015 | 14 | 19 | 14 | 19 | 14 | 19 | 14 | 19 |

| Time Buckets | | | Bucketing under each Business Day Convention | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Prior | | Conditional Prior | | Following | | Conditional Following | |
| Bucket Name | Start Date | End Date | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow | Inflow | Outflow |
| 2-2 Day | 1/29/2015 | 1/29/2015 | 56 | 63 | 15 | 27 | 15 | 27 | 56 | 63 |
| 3-3 Day | 2/1/2015 | 2/1/2015 | 25 | 11 | 66 | 47 | 66 | 47 | 25 | 11 |
| 4-4 Day | 2/2/2015 | 2/2/2015 | 26 | 14 | 26 | 14 | 26 | 14 | 26 | 14 |
| 5-5 Day | 2/3/2015 | 2/3/2015 | 16 | 28 | 16 | 28 | 16 | 28 | 16 | 28 |
| 6-6 Day | 2/4/2015 | 2/4/2015 | 26 | 22 | 26 | 22 | 26 | 22 | 26 | 22 |
| 7-7 Day | 2/5/2015 | 2/5/2015 | 63 | 65 | 30 | 21 | 30 | 21 | 63 | 65 |
| 8-14 Day | 2/8/2015 | 2/17/2015 | 74 | 51 | 107 | 95 | 107 | 95 | 74 | 51 |
| >14 Days | 2/18/2015 | | | | | | | | | |
| Total | | | 300 | 273 | 300 | 273 | 300 | 273 | 300 | 273 |

**Note**:

1. The method of calculating the time buckets based on business days is applicable only when the Business Day Convention in the Run Management window is selected as either Prior, Conditional Prior, Following or Conditional Following.
2. If the Business Day Convention is selected as **No Adjustment**, then the process followed for calendar day based calculation is followed here as well. The times bucket start and end dates are calculated based on calendar days irrespective of the selection of Time Buckets Based On in the Run Management window. Cash flows are then bucketed without considering special treatment for holidays as illustrated in section Calendar Days above.

.

# 6 Business Assumptions

## 6.1 Overview

Business assumptions are behavior patterns exhibited by a bank's customers or by the bank itself, which result in a change in the cash flows that occur purely under contractual terms. These include run-offs, prepayments, rollovers, draw downs, asset sale, delinquencies, recoveries, haircuts, and so on. The application allows business assumptions to be defined under normal conditions. That is, business-as-usual or under multiple stress conditions, through a parameterized and flexible graphical user interface.

The assumptions defined under multiple conditions will differ in the magnitude of the behavior exhibited, which results in either change in the cash inflows and outflows. For instance, the run-off rate under normal conditions for certain deposits may be 2%, under a mild stress scenario it may be 8%, and under a severe and prolonged stress scenario, it may be 20%. The application allows you to define and maintain a library of such business assumptions of varying magnitudes and with different parameters. Once saved and approved, a business assumption is registered as a Process in the Rules Framework of Oracle Financial Services Analytical Applications Infrastructure and can be used across multiple scenarios, Runs and time periods for computing liquidity risk metrics.

The assumptions can be used to compute liquidity gaps and liquidity ratios under BAU and stress scenarios. The application supports pre-packaged business assumption required for computing liquidity coverage ratio in accordance with the BIS Basel III and US Federal Reserve liquidity coverage ratio guidelines.

On execution of a BAU or stress Run, one or multiple business assumptions are applied to the contractual cash flows whose attributes correspond to the dimensions specified in the assumption. The application of an assumption results in an increase or decrease in cash flows, movement of cash flows from one bucket to another, change in the value or the encumbrance status of an account depending on the type of business assumption.

## 6.2 Business Assumptions Supported

The application supports the following types of business assumptions:

a. Cash Flow Movement
    - Cash Flow Movement
    - Asset Sale
    - Cash Flow Delay
    - Delinquency
    - Prepayment
    - Recovery
    - Rollover

- Run-off

b. Encumbrance
   - Encumbrance
   - Ratings Downgrade
   - Valuation Changes

c. Incremental Cash Flow
   - Incremental Cash Flow
   - Drawdown
   - New Business
   - Ratings Downgrade
   - Run-off
   - Secured Funding/Financing
   - Valuation Changes

d. Value Change
   - Available Stable Funding Factor
   - Haircut
   - Required Stable Funding Factor

The computations related to each assumption category and sub-category is explained in detail, in the following sections.

### 6.2.1 Cash Flow Movement

Cash Flow Movement is a category of Business Assumptions that moves the cash flows move from the original time bucket to a prior bucket or a subsequent time bucket, based on the Assumption Sub Category, which is selected.

#### 6.2.1.1 Cash Flow Movement

This is a generic assumption, which enables you to define cash flow movements based on all combinations available as part of Cash Flow Movement category. That is, it is a superset of all the functionality supported by each sub category in this assumption category.

This assumption moves the cash flows occurring in the original time bucket to a new user specified time bucket, occurring prior to or post the original time bucket, based on the assumption value specified.

Refer section Cash Flow Movement for information on the steps involved in specifying this assumption.

#### 6.2.1.2 Asset Sale

This assumption is a specific case of cash flow movement category where cash flows posted in the original maturity bucket of an asset are moved to a prior bucket due to a sale. This assumption allows you to specify a sale of unencumbered marketable, fixed, or other assets to advance the cash inflows. Sale can be specified on each individual asset or as a combination of dimensions. This assumption allows you to specify a partial sale of assets by specifying the sale amount. The assumption reverses all original cash flows that occur between the sale bucket and maturity bucket and posts the market value less haircut in the sale bucket.

Refer section Asset Sale for information on the steps involved in specifying this assumption.

The steps involved in applying the asset sale assumption to cash flows are as follows:

a. The new inflows are calculated due to sale based on the current market or fair value (in case of marketable and fixed assets) or current outstanding balance (in case of other assets such as loans) and haircut.
b. For instance, if the face value of a bond is 100, market value is 120 and sale is specified as 50%, then new inflows are 60 (i.e. 120*50%). Similarly if the outstanding balance of a loan is 10000 and sale is specified at 75% with a haircut of 5%, the new inflow is 7125 [10000*75 % *(1 – 5 %)].
c. The original time bucket(s) are identified in which the asset(s) matures and the original cash inflows, both principal and interest, in each time bucket.
d. The original cash inflows to be reversed are calculated. This is proportionate to the sale amount and is calculated based on the original value.
e. In the example of the bond it will be 50 (i.e. 100*50%). In the example of the loan, it will be 75% of the original principal and interest payments.
f. The cash inflows are assigned due to sale to the sale bucket and reverse the proportionate original cash flow in the respective original buckets.
g. The number of units held is updated post sale in case of marketable assets and the outstanding balance in case of other assets. For all further computations, the revised asset balance is used.

If a sale is specified as an amount or in terms of units, it is converted into a percentage of the market value or outstanding balance for the purpose of reversing the original cash flows. For instance, a bank has 10 bonds whose total market value is $1200 and original value is $1000.

a. When sale is specified as $900 pre-haircut value, the percentage sold is 75% (i.e. 900/1200). The original cash flow to be reversed is $750 (1000*75%).
b. When sale is specified as 5 units, the percentage sold is 50% (i.e. 5/10). The original cash flow to be reversed is $500 (1000*50%).

**Note**:

- Assets can only be sold in buckets that are prior to the original bucket. That is, their maturity bucket.
- If an asset is currently encumbered but its encumbrance period is less than its maturity, it can be sold in the time bucket occurring between the last day of encumbrance and its maturity.

- Other assets include unencumbered loans and other non-marketable assets.
- A sale of assets removes all future cash flows, both principal and interest and results in a new inflow at the sale bucket.
- Haircut is applied to the sale value only that is, market value in case of marketable and fixed assets and outstanding balance in case of other assets. Original cash flow reversal will not include haircut.
- If sale is specified as an amount, it is considered as the pre-haircut amount.
- When converting the sale amount to a percentage, the pre-haircut amount is to be considered.

An illustration of the asset sale business assumption is provided below. This example is based on the equal cash flow assignment methodology. The original value of the asset in the 1-5 year bucket is 48000 and > 5 year bucket is 32000. The current market value is 1245 per unit and the number units held is 100.

| **Business Assumption Definition** | | | | | **Cash Flow Assignment** | | |
|---|---|---|---|---|---|---|---|
| **Product Type** | **Rating** | **Sale Amount / Percentage** | **Haircut** | **Time Bucket** | **Contractual Cash Flow** | **Time Bucket** | **Revised Cash Flow** |
| Bond | BBB | 40% | 10% | 8-15 Days | 10000 | Overnight | 24940<br>[= 10000 + {(1245*100*40%*90%)/3}] |
| | | | | | 5000 | 1-7 Days | 19940<br>[= 5000 + {(1245*100*40%*90%)/3}] |
| | | | | | 8000 | 8-15 Days | 22940<br>[= 8000 + {(1245*100*40%*90%)/3}] |
| | | | | | 119870 | 1-5 Years | 100670<br>[=119870 – (48000*40%)] |
| | | | | | 200907 | > 5 Years | 188107<br>[=200907 – (32000*40%)] |

**Table 9 Cash Flow Movement - Asset Sale**

#### 6.2.1.3 Cash Flow Delay

Due to market conditions the payments or receipts that are expected at a particular time are delayed thereby giving rise to liquidity risk. In such a scenario the payments or receipts that were expected as on date will now be available at a future date. This assumption moves the expected cash flows in a particular time bucket to one or multiple future time buckets based on a percentage of the cash flow occurring in that bucket. In a cash flow delay assumption, cash flow movement happens from previous buckets to the future buckets.

Refer section Cash Flow Delay for information on the steps involved in specifying this assumption.

The following steps are involved in applying the delay in cash flow timing assumption to cash flows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption. This is the delayed payment or receipt amount excluding penalty which is reversed.
b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties on the delayed payments or receipts, if any.

In cash flow delay assumption, the cash flow movement is always to a future time bucket. Therefore, 0% is assigned to the previous buckets in case of Increasing/Decreasing assignment as illustrated below:

Illustration: Delays assigned to a selected time bucket

| **Business Assumption Definition** | | | | | | **Computation Assignment** | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Product** | **Currency** | **From Bucket** | **To Bucket** | **Delayed Amount** | **Penalty** | **Contractual Cash flow (From Bucket)** | **Contractual Cash flow (To Bucket)** | **Revised Cash flow - From Bucket** | **Revised Cash flow -To Bucket** |
| Vehicle Loan | US Dollars | 10-10 Days | 12-12 Days | 10% | 5% | 30000 | 23000 | 27000 [=(30000-30000*10%)] | 26150 [=23000+ (30000*10%) + {(30000*10%)*5%}] |

**Table 10 Cash Flow Movement - Cash Flow Delay**

#### 6.2.1.4 Delinquency

This assumption caters to the large and non large customers. This assumption is based on the anticipation of the bank that there can be an emergency loss due to delinquency of its customers which will affect the future cash flows. When a customer becomes delinquent, the cash flows of the delinquent buckets (as specified in percentage and amount) are moved to the overnight bucket. If you want to specify delinquency on large customers, then large customer dimension is selected; however the computation of cash flows is same for both large and non large customers. In a delinquency assumption, cash flow movement happens from forward bucket/s to the previous bucket (Overnight).

Refer section Delinquency for information on the steps involved in specifying this assumption.

The steps involved in applying the delay in cash flow timing assumption to cash flows are as follows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.

b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.

c. If time specific or critical obligation, record the delay and indicate a breach.

Cash flow assignment is done in the following manner:

$$\boldsymbol{Cash\ Flow_{for\ Original\ Bucket}} = -1 * \left(\boldsymbol{Cash\ Flow_{Original\ Bucket}}\right)$$

$$\boldsymbol{Cash\ Flow_{for\ Overnight\ Bucket}} = \left(\boldsymbol{Cash\ Flow_{Overnight\ Bucket}}\right) + \left(\boldsymbol{Cash\ Flow_{Original\ Bucket}}\right)$$

An example of the assumption applied to product type (Business loan), and currency (USD) for Large and Non Large Customers is illustrated below:

Illustration 1: Delays assigned to a selected time bucket

| **Business Assumption Definition** | | | | **Computation Assignment** | | | | |
|---|---|---|---|---|---|---|---|---|
| **Product** | **Customer** | **From Bucket** | **Delinquent Value** | **Contractual Cash Flow (From Bucket)** | **Contractual Cash Flow (Overnight Bucket)** | **Delinquent (Value)** | **Revised Cash flow - From Bucket** | **Revised Cash flow (Overnight Bucket)** |
| Business Loans | Large Customer | 8-8Days | 10% | 30000 | 23000 | 3000 [= (30000* 10%)] | 27000 [=(30000- 3000)] | 40600 [=(23000+3000 +5000+9600)] |
| | | 9-9Days | 20% | 25000 | | 5000 [= (25000*20%)] | 20000 [=(25000-5000)] | |
| | | 10-10Days | 30% | 32000 | | 9600 [= (32000*30%)] | 22400 [=(32000-9600)] | |

Illustration 2: Delays assigned to a selected time bucket

| **Business Assumption** | | | | **Computation Assignment** | | | | |
|---|---|---|---|---|---|---|---|---|
| **Product** | **Customer** | **From Bucket** | **Delinquent Value** | **Contractual Cash Flow (From Bucket)** | **Contractual Cash Flow (Overnight Bucket)** | **Delinquent (Value)** | **Revised Cash flow - From Bucket** | **Revised Cash flow (Overnight Bucket)** |
| Home Loans | Non- Large Customer | 3-3 Days | 15% | 15000 | 23000 | 2250 [= (15000*15%)] | 12750 [=(15000-2250)] | 27350 [=(23000+2250+2100)] |
| | | 4-4 Days | 10% | 21000 | | 2100 [= (21000* 10%)] | 18900 [=(21000- 2100)] | |

**Table 11 Cash Flow Movement – Delinquency**

#### 6.2.1.5 Prepayment

Prepayment is a situation where the customer repays the loan in part or full, at any time before the maturity of the loan. Prepayment would lead the bank to lose out on the interest component that it would have received if the loan was not pre-paid. Prepayment results in a cash inflow in a time bucket prior to the original time bucket and reduced cash inflow in the original time bucket. The percentage of prepayment is to be specified by you and the balance is payable only when it is due.

The prepayment supports prepayments on liabilities as well as assets in a single business assumption definition.

If a prepayment is specified on an asset or liability backed by collateral, the encumbrance period of the underlying collateral is re-calculated based on time bucket in which the asset or liability is completely paid up.

Refer section Prepayment for information on the steps involved in specifying this assumption.

The steps involved in applying the delay in cash flow timing assumption to cash flows are as follows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.

b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.

c. If time specific or critical obligation, record the delay and indicate a breach.

Cash flow assignment is done in the following manner:

$$\boldsymbol{Cash\ Flow_{for\ Original\ Bucket} = -1 * \left(Cash\ Flow_{Original\ Bucket} * Percentage\ Specified\right) OR \left(Amount\ Specified\right)}$$

$$\boldsymbol{Cash\ Flow_{for\ Revised\ Bucket} = (Cash\ Flow_{Original\ Bucket} * Percentage\ Specified)\ OR\ (Amount\ Specefied)}$$

An example which explains the Assumption Value Based on Original Cash Flows across Business Assumptions is illustrated below.

A prepayment of 10% from 8-15 Day bucket to 1-7 Day bucket and a 20% rollover is defined from 1-7 Day bucket to 8-15 Day bucket. The contractual cash flow in 1-7 Day bucket is 5000 and 8-15 Day bucket is 8000. The impact on the 1-7 Day bucket based on original cash flows is illustrated below:

| Cash Flow Assignment | | | |
|---|---|---|---|
| **Assumption** | **Contractual Cash Flow in 1-7 Day Bucket** | **Impact of Assumption** | **Post-Assumption Cash Flow** |
| No Assumption | 5000 | 0 | 5000<br>[=5000 – 0] |
| Prepayment | 5000 | 800<br>[= (8000*10%)] | 5800<br>[=5000 + 800] |
| Rollover | 5800 | – 1000<br>[= – (5000*20%)] | 4800<br>[= 5800 – 1000] |

**Table 12 Cash Flow Movement Prepayment**

In this case, even though the cash flow has changed after applying the prepayment assumption, the original cash flow is used for estimating the impact of the rollover assumption.

#### 6.2.1.6 Recovery

Recovery assumes part/full amount recovered from delinquent/ defaulted accounts. In this assumption, the contractual cash flows assigned to the overnight time bucket is considered. Even though contractually it is due immediately, the actual recovery takes place only over a period of time. In this assumption, the contractual cash flows assigned to the overnight time bucket is considered. Hence, based on past experiences you are allowed to specify the percentage of recovery in each time bucket. The balance percentage which is not specified by you is placed in the unspecified time bucket. Hence, the contractual cash flow is first deducted from the overnight time bucket and assigned to various other time buckets based on the defined percentages.

Refer section Recovery for information on the steps involved in specifying this assumption.

The steps involved in applying the delay in cash flow timing assumption to cash flows are as follows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.

b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.

c. If time specific or critical obligation, record the delay and indicate a breach.

Cash flow assignment is done for delinquent/defaulted cash flows in the following manner:

$$\boldsymbol{Cash\ Flow_{for\ Overnight\ Bucket}} = -1 * \left(\boldsymbol{Cash\ Flow_{Overnight\ Bucket}} * \boldsymbol{Percentage\ Specified}\right) \boldsymbol{OR}\ (\boldsymbol{Amount\ Specified})$$

$$\boldsymbol{Cash\ Flow_{for\ Selected\ Bucket}} = \left(\boldsymbol{Cash\ Flow_{Original\ Bucket}} * \boldsymbol{Percentage\ Specified}\right) \boldsymbol{OR}\ (\boldsymbol{Amount\ Specified})$$

$$\boldsymbol{Cash\ Flow_{for\ Unspecified\ Bucket}} = \left(\boldsymbol{Remaining\ Cash\ Flow_{Overnight\ Bucket}}\right)$$

An example of the assumption applied to product type (loan), legal entity (LE 1) and currency (USD) is illustrated below:

| **Business Assumption Definition** | | | | | | **Cash flow Assignment** | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Product Type** | **Legal Entity** | **Currency** | **Loan Status** | **Time Bucket** | **Business Assumption** | **Time Bucket** | **Default Cash Flow** | **Business Assumption** | **Adjusted Cash flow** |
| Product 01 | LE 1 | USD | Default | 1 – 30 days | 10% | Overnight | 10000 | | 0 [=(10000-10000)] |
| | | | | | | 1 – 30 days | | 10% | 1000 [= (10% *10000)] |
| | | | | 30 – 60 days | 15% | 30 – 60 days | | 15% | 1500 [=(15%* 10000)] |
| | | | | 60 – 180 days | 25% | 60 – 180 days | | 25% | 2500 [=(25% * 10000)] |

| Business Assumption Definition | | | | | | Cash flow Assignment | | | |
|---|---|---|---|---|---|---|---|---|---|
| Product Type | Legal Entity | Currency | Loan Status | Time Bucket | Business Assumption | Time Bucket | Default Cash Flow | Business Assumption | Adjusted Cash flow |
| | | | | | | Unspecified<br>i.e. 180 - | | | 5000<br>[=(10000-1000-1500-2500)] |

**Table 13 Cash Flow Movement - Recovery**

### 6.2.1.7 Rollover

Rollover refers to the rescheduling of a certain percentage of cash flows to a future time bucket. This occurs when an asset/liability is renewed for an additional term. The amount of cash flow rolled over is thus reduced/increased from the original time bucket and assigned to the new time bucket in the future.

Earlier in 2.0 Rollover of Assets and Rollover of Liabilities were two different assumptions. Now, a single assumption allows you to select both assets and liabilities and the assumption takes care of the assigning the assignment.

The assumption specification and computation method for this sub category remain unchanged. This sub category allows rollovers to be specified even on repos, reverse repos and swaps. In case of rollover of swaps, the user is required to select the transaction legs option as two.

If a rollover is specified on an asset or liability that has underlying collateral, then the availability of the underlying should be determined. Only if the underlying collateral is available during the extended period, the assumption should be allowed to be saved

Rollover of assets impacts the inflow amount and rollover of liabilities impacts the cash outflow amount. The signage and computation depends on the product type selected. In a rollover assumption, cash flow movement happens from previous bucket/s to the forward buckets.

Refer section Rollover for information on the steps involved in specifying this assumption.

The steps involved in applying the delay in cash flow timing assumption to cash flows are as follows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.
b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.
c. If time specific or critical obligation, record the delay and indicate a breach.

Rollover of Assets refers to the rescheduling of a certain percentage of cash flows to a future time bucket. This occurs when an asset is renewed for an additional term. The amount of cash flow rolled over is thus reduced from the original time bucket and assigned to the new time bucket. The effect of this assumption would be an altered final cash flow in the affected time buckets. Rollover of assets impacts the inflow amount.
Cash flow assignment is done in the following manner:

$$\boldsymbol{Cash\ Flow_{for\ Original\ Bucket}} = -1 * \left(\boldsymbol{Cash\ Flow_{Original\ Bucket}} * \boldsymbol{Percentage\ Specified_{for\ Revised\ Bucket}}\right)$$

$$\boldsymbol{OR}\ \left(\boldsymbol{Amount\ Specified_{for\ Revised\ Bucket}}\right)$$

$$\boldsymbol{Cash\ Flow_{for\ Revised\ Bucket}} = \left(\boldsymbol{Cash\ Flow_{Original\ Bucket}} * \boldsymbol{Percentage\ Specified_{for\ Revised\ Bucket}}\right)$$

$$\boldsymbol{OR}\ \left(\boldsymbol{Amount\ Specified_{for\ Revised\ Bucket}}\right)$$

For instance, Rollover of Assets is explained in the following example of the assumption applied to product type (Loan), legal entity (LE 1) and currency (USD).

| **Business Assumption Definition** | | | | | | **Cash flow Assignment** | | |
|---|---|---|---|---|---|---|---|---|
| **Product Type** | **Legal Entity** | **Currency** | **Original Maturity Bucket** | **Revised Time Bucket** | **Rollover %** | **Contractual Cash flow** | **Time Bucket** | **Revised Cash flow amount** |
| Loan | LE 1 | USD | 15-30 Days | 60-90 Days | 10% | 10000 | 15-30 Days | 3000<br>[= 10000 – (10%* 10000) – (60% * 10000)] |
| | | | | | | 5000 | 60-90 Days | 6000<br>[(= 5000 + (10* 10000)] |
| | | | | 180-360 Days | 60% | 7000 | 180-360 Days | 13000<br>[= 7000 + (60%* 10000)] |

**Table 14 Cash Flow Movement - Rollover**

Rollover of liabilities refers to the rescheduling of a certain percentage of cash flows to a future time bucket. It occurs when the liabilities are renewed for an additional term. The amount of cash flow rolled over is thus increased in the original maturity time bucket and assigned to the new maturity time bucket. The effect of the business assumption would be an altered final cash flow in the various time buckets. Rollover of liabilities impacts the cash outflow amount.

Cash flow assignment is done in the following manner:

$$\boldsymbol{Cash\ Flow}_{\boldsymbol{for\ Original\ Bucket}} = \boldsymbol{-1} * \left(\boldsymbol{Cash\ Flow}_{\boldsymbol{Original\ Bucket}}\ \boldsymbol{Percentage\ Specified}_{\boldsymbol{for\ Revised\ Bucket}}\right)$$

$$\boldsymbol{OR}\ \left(\boldsymbol{Amount\ Specified}_{\boldsymbol{for\ Revised\ Bucket}}\right)$$

$$\boldsymbol{Cash\ Flow}_{\boldsymbol{for\ Revisied\ Bucket}} = \left(\boldsymbol{Cash\ Flow}_{\boldsymbol{Original\ Bucket}} * \boldsymbol{Percentage\ Specified}_{\boldsymbol{for\ Revised\ Bucket}}\right) \boldsymbol{OR}\ \left(\boldsymbol{Amount\ Specified}_{\boldsymbol{for\ Revised\ Bucket}}\right)$$

#### 6.2.1.8 Run-Off

In a Run-off assumption the bank assumes that a certain percentage of deposits/liabilities will be withdrawn by their customers before the scheduled maturity of the deposit. This business assumption would result in an additional outflow in an earlier time bucket and a reduction in the contractual cash outflow in the original time bucket. The assumption can also be applied to assets as well, where the impact on cash flows will be opposite to that specified for deposits above.

The cash flow movement happens from forward bucket/s to the previous bucket/s since cash flows which were expected to be withdrawn at a future date are getting withdrawn as on date.

Refer section Run Off for information on the steps involved in specifying this assumption.

The steps involved in applying the delay in cash flow timing assumption to cash flows are as follows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.
b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.
c. If time specific or critical obligation, record the delay and indicate a breach.

Cash flow assignment is done in the following manner:

$$Cash\ Flow_{for\ Original\ Bucket} = -1 * \left(Cash\ Flow_{Original\ Bucket} * Percentage\ Specified\right)\ OR\ (Amount\ Specified)$$

***Cash Flow*** *for Revised Bucket*

***= (Cash Flow*** *Original Bucket*

**** Percentage Specified) OR (Amount Specified)***

An illustration is as follows:

| **Business Assumption Definition** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Legal Entity** | **Customer** | **From Bucket** | **To Bucket** | **Assumption Unit** | **Run-off** | **Assignment Method** | **Assumption Category** | **Based On** |
| Legal Entity 1 | Customer 2 | 6-6Days | 3-3Days | Percentage | 10% | Equal | Cash Flow Movement : Run - off | Cash Flows |

| **Cash flow Assignment** | | | | | |
|---|---|---|---|---|---|
| **To Bucket** | **Contractual Cash Flow (From Bucket)** | **Contractual Cash Flow (To Bucket)** | **Run-off** | **Revised Cash flow - From Bucket** | **Revised Cash flow -To Bucket** |
| Overnight | 20000 | 10000 | 500 [=(20000*10%)/4] | 18000 [(20000-20000*10%)] | 10500 [=(10000+500)] |
| 1-1 Day | | 11000 | 500 [=(20000*10%)/4] | | 11500 [=(11000+500)] |
| 2-2 Days | | 22000 | 500 [=(20000*10%)/4] | | 22500 [=(22000+500)] |
| 3-3 Days | | 12000 | 500 [=(20000*10%)/4] | | 12500 [=(12000+500)] |

**Table 15 Cash Flow Movement - Run-off**

## 6.2.2 Encumbrance

### 6.2.2.1 Encumbrance

This is a generic assumption which can be defined and caters to the different combinations available as part of rating downgrade and valuation changes of collateral.

Refer section Encumbrance for information on the steps involved in specifying this assumption.

The following steps are involved in applying the delay in cash flow timing assumption to cash flows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.
b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.
c. If time specific or critical obligation, record the delay and indicate a breach.

### 6.2.2.2 Ratings Downgrade

In a bank, because of some financing transactions or derivatives with embedded downgrade triggers, downgrade in a bank's rating by a recognized credit rating institution will require the bank to post additional collateral. This assumption will impact the numerator of LCR that is, decrease in the market value of HQLA.

For some financing transactions or derivatives with embedded downgrade triggers, downgrade in a bank's rating by a recognized credit rating institution will require the bank to post additional collateral. The encumbrance assumption category assumes that the asset required to be posted as additional collateral is already available with the bank and will be encumbered. This will result in deduction of the relevant amount from the stock of high quality liquid assets as it is now no longer unencumbered.

**NOTE:** The assumption specification and computation method for this sub category corresponds to that available as part of the Additional Collateral - Rating Downgrade Decrease in Asset assumption type. This assumption is renamed as Ratings Downgrade in this version.

Refer section Ratings Downgrade for information on the steps involved in specifying this assumption.

The steps involved in applying the delay in cash flow timing assumption to cash flows are as follows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.
b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.
c. If time specific or critical obligation, record the delay and indicate a breach.

New Stock of *HQLA* assignment is done in the following manner:

$$\boldsymbol{Stock\ of\ High\ Quality\ Liquid\ Asset\ to\ be\ reduced}$$

$$= \left(\boldsymbol{Collateral\ Amount}_{\boldsymbol{for\ the\ specified\ notch}} * \ \boldsymbol{Percentage\ Specified}_{\boldsymbol{for\ Revised\ Bucket}}\right)$$

$$\boldsymbol{OR}\ \left(\boldsymbol{Amount\ Specified}_{\boldsymbol{for\ Revised\ Bucket}}\right)$$

Assuming a downgrade trigger of 3-Notches, this assumption is specified as follows:

| **Business Assumption Definition** | | **Cash Flow Assignment** | | |
|---|---|---|---|---|
| **Asset Level** | **Downgrade Impact Value** | **Downgrade Impact Amount** | **Downgrade** | **Decrease in HQLA** |
| Level 1 Asset | 80% | 11000 | 1 Notch | 8800<br>[= (11000*80%)] |
| Level 1 Asset | 100% | 9000 | 2 Notches | 9000<br>[= (9000*100%)] |
| Level 1 Asset | 80% | 80000 | 3 Notches | 64000<br>[= (80000*80%)] |

**Table 16 Encumbrance - Ratings Downgrade**

#### 6.2.2.3 Valuation Changes

This is based on the assumption that a bank would require posting additional collateral because of a decrease in the value of current assets.

This assumption impacts the numerator of LCR that is; it results in a decrease in the stock of HQLA.

In this assumption, the additional collateral posted will result in the selected assets being marked as encumbered. The relevant amount is deducted from the stock of high quality liquid assets where applicable. These assets will not be available for the purpose of counterbalancing or for estimating the cash inflows for LCR.

This assumption supports changes in the value of the collateral posted due to changes in market valuation of transaction or changes in the contract value. This further leads to cash outflow.

This assumption impacts the denominator of LCR that is, increase in the outflow for the Legal Entity.

Some derivatives are secured by collateral to cover losses arising from changes in mark-to-market valuations. For changes in the value of the derivative, additional collateral is posted

resulting in a cash outflow. The valuation changes can be with Natural currency or Selected Currency. Valuation changes can be specified in Amount or Percentage. Here, both ratings and notches downgrade are not applicable.

The time buckets selected as part of the assumption parameters are the impacted time buckets.

**NOTE:** The assumption specification and computation method for this sub category corresponds to that available as part of the Additional Collateral - Valuation Changes – Asset Value Decrease assumption type. This assumption is renamed as Valuation Changes in this version.

Refer section Valuation Changes for information on the steps involved in specifying this assumption.

The steps involved in applying the delay in cash flow timing assumption to cash flows are as follows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.
b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.
c. If time specific or critical obligation, record the delay and indicate a breach.

An example is as follows:

| Based On | Assumption Unit | Assignment Method |
|---|---|---|
| Market Value | Percentage | Selected |

| Legal Entity | Product | Valuation Change Impact |
|---|---|---|
| LE 1 | P4 | 100% |
| LE 2 | P5 | 50% |
| LE 3 | P4 | 20% |
| LE 4 | P5 | 30% |

| Legal Entity | Product Type | Original Market Value | Revised Market Value |
|---|---|---|---|
| LE 1 | P4 | 520000 | 0 [=520000-(100% * 520000)] |
| LE 2 | P5 | 610000 | 305000 [610000- (50%*610000)] |
| LE 3 | P4 | 160000 | 128000 [160000-(20% * 160000)] |
| LE 4 | P5 | 120000 | 84000 [120000-(30% * 120000)] |

**Table 17 Encumbrance – Valuation Changes**

## 6.2.3 Incremental Cash Flow

### 6.2.3.1 Incremental Cash Flow

This is a generic assumption which enables you to define and caters to the different combinations available as part of Incremental Cash Flow.

Refer section Incremental Cash Flow for information on the steps involved in specifying this assumption.

The steps involved in applying the delay in cash flow timing assumption to cash flows are as follows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.

b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.

c. If time specific or critical obligation, record the delay and indicate a breach.

#### 6.2.3.2 Drawdown

The assumption types Drawdown of Unutilized Credit and Drawdown of Funding Line of Credit, have been merged as part of the drawdown sub category. The assumption specification and computation method for this sub category remain unchanged. This sub category allows drawdown to be specified on lines of credit extended as well as received by banks in a single business assumption.

There is an amount line given to the bank or received by the banks which are allowed to drawdown. This allows drawdown to be specified on lines of credit extended as well as received by Banks.

**Drawdown of Unutilized Credit**: Banks generally allow its customers to withdraw a certain amount which is a percentage of the value specified as the limit. This business assumption is applied to the undrawn portion, the assumption being that certain portion of the undrawn amount is drawn by the customer at the specified time bucket thus leading to additional cash outflows. This assumption also allows you to specify the corresponding cash inflow for the specified cash outflow.

**Drawdown of Funding Line of Credit**: Banks also receive lines of credit from other banks and financial institutions. The bank can drawdown these lines as per its requirement at anytime during the tenure of the facility. A percentage of the total undrawn amount is assumed to be drawn down over each time bucket. Drawdown of funding line of credit results in cash inflow first and outflow at a later date. This assumption also allows you to specify the corresponding cash outflow for the specified cash inflow

This assumption also allows you to specify the corresponding cash inflow for the specified cash outflow.

Refer section Drawdown for information on the steps involved in specifying this assumption.

The steps involved in applying the delay in cash flow timing assumption to cash flows are as follows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.

b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.

c. If time specific or critical obligation, record the delay and indicate a breach.

Various options for cash flow assignment are available. Refer section Cash Flows.

An illustration for drawdown is as follows:

| |
|---|
| ***Cash Inflow = Undrawn Amount × Drawdown %*** |
| ***Cash Outflow = Cash Inflow × Outflow %*** |

| Business Assumption Definition | | | | | Cash Flow Assignment | | |
|---|---|---|---|---|---|---|---|
| **Product Type** | **Primary Bucket** | **Off-Set Bucket** | **Undrawn amount** | **Drawdown Value** | **Contractual Cash Flow** | **Time Bucket** | **Revised Cash Flow** |
| Loan | 1-7 Days | 8-15 Days | 10000 | 30% | 5000 | 1-7 Days | 8000<br>[= 5000 +30%* 10000] |
| | | | | | 8000 | 8-15 Days | 5000<br>[=8000 – 30%*10000] |

Here,

Primary bucket = Inflow bucket

Offset bucket = Outflow bucket

**Table 18 Incremental Cash Flow – Drawdown**

#### 6.2.3.3 Liability Run-off

When the markets are inaccessible to the banks due to several reasons, the cash flows continue to run-off contractually. However, no new business is allowed due to market inaccessibility. Banks are required to maintain a pre-defined levels of balance at all times. In some cases, due to market inaccessibility the balance goes down and banks are required to restore the balance to the pre-defined levels over a period of time, called the restoration period.

The procedure for calculating cash flows based on the liability run-off business assumption is as follows:

1. Run-off the contractual cash flows till the end of the market inaccessibility period.
2. The sum of cash outflows during the market inaccessibility period is computed.
3. The balance to be maintained at the end of the portfolio restoration period is computed as follows:

$$\boldsymbol{Post\ Restoration\ Target\ Balance} = \boldsymbol{Max}[\boldsymbol{Minimum\ Balance}, (\boldsymbol{Current\ Balance} \times \boldsymbol{Restoration}\ \%)]$$

4. The balance at the end of the market inaccessibility period is computed as follows:

$$\boldsymbol{Post\ Market\ Inaccessibility\ Balance} = \boldsymbol{Current\ Balance} - \boldsymbol{Sum\ of\ Cash\ Outflows}_{\boldsymbol{Market\ Inaccessibility\ Period}}$$

5. The total re-issue amount is computed as follows:

$$\boldsymbol{Total\ Reissue\ Amount} = \boldsymbol{Post\ Restoration\ Target\ Balance} - \boldsymbol{Post\ Market\ Inaccessibility\ Balance}$$

6. If re-issue amount is positive,
   i. All contractual cash flows occurring after market inaccessibility period is removed.
   ii. The re-issue allocation days as the number of business days in the portfolio restoration period is calculated.

iii. The re-issue amount per business day is calculated as follows:

$$\textbf{Reissue Amount per Day} = \frac{\textbf{Total Reissue Amount}}{\textbf{Reissue Allocation Days}}$$

iv. The reissue amount per day as a cash inflow on each business day during the portfolio restoration period is posted.

7. If re-issue amount is negative,

i. If the outstanding contractual balance at the end of portfolio restoration period is greater than the post restoration target balance

a. The additional run off during per business day is computed as follows:

$$\textbf{Additional Run} - \textbf{off per Day} = \frac{(-\textbf{Total Reissue Amount}) - \textbf{Contractual Run off during restoration period}}{\textbf{Reissue Allocation Days}}$$

b. The additional run off per day as cash outflow on each business day during the portfolio restoration period in addition to contractual cash outflow is posted.

ii. If the contractual balance at the end of portfolio restoration period is less than the post restoration target balance

a. The contractual cash outflows on each business day following the market inaccessibility period, till the outstanding balance is equal to the post restoration target balance is posted.

b. All contractual cash outflows after the day on which the outstanding balance is equal to the post restoration target balance is removed.

An illustration for Liability Run-off is as follows:

**Inputs**:

| | |
|---|---|
| As of Date | 13-Apr-14 |
| EOP Balance | 4698.24 |
| Inaccessibility End Bucket | 9-9 Day |
| Restoration End Bucket | 20-20 Day |
| Minimum Balance | 100 |
| Restoration % | 1% |

**Time Periods and Balances**:

| | |
|---|---|
| Market Inaccessibility End Date | 22-Apr-14 |
| Restoration End Date | 3-May-14 |
| Market Inaccessibility Period | 9 |
| Portfolio Restoration Period | 11 |
| Contractual Cash Outflows during Inaccessibility Period | 2321.93 |
| Post Restoration Target Balance | 100.00 |

| | |
|---|---|
| Post Market Inaccessibility Balance | 2376.30 |
| Contractual Run-off during Restoration | 2056.58 |
| Post Restoration Outstanding Contractual Balance | 319.72 |
| Total Reissue Amount | -2276.30 |
| Reissue Allocation Days | 8 |
| Reissue Amount per Day | 0.00 |
| Additional Run-off per Day | 27.47 |

The below example shows, the cash flows when re-issue amount is negative and post restoration outstanding contractual balance and post restoration target balance.

| Inputs | | | Calculation | | | | |
|---|---|---|---|---|---|---|---|
| **Calendar Date** | **Contractual Cash Outflow** | **Contractual Cash Inflow** | **Day from As of Date** | **Holiday Indicator** | **Cumulative Cash Outflow (Post inaccessibility period)** | **Post Assumption Cash Outflow** | **Post Assumption Cash inflow** |
| 4/14/2014 | 919.85 | 0.00 | 1 | | 0.00 | 919.85 | 0.00 |
| 4/15/2014 | 341.48 | 0.00 | 2 | | 0.00 | 341.48 | 0.00 |
| 4/16/2014 | 320.37 | 0.00 | 3 | | 0.00 | 320.37 | 0.00 |
| 4/17/2014 | 291.37 | 0.00 | 4 | | 0.00 | 291.37 | 0.00 |
| 4/18/2014 | 131.73 | 0.00 | 5 | | 0.00 | 131.73 | 0.00 |
| 4/19/2014 | 0.00 | 0.00 | 6 | Y | 0.00 | 0.00 | 0.00 |
| 4/20/2014 | 0.00 | 0.00 | 7 | Y | 0.00 | 0.00 | 0.00 |
| 4/21/2014 | 198.15 | 0.00 | 8 | | 0.00 | 198.15 | 0.00 |
| 4/22/2014 | 118.98 | 0.00 | 9 | | 0.00 | 118.98 | 0.00 |
| 4/23/2014 | 33.59 | 0.00 | 10 | | 0.00 | 61.05 | 0.00 |
| 4/24/2014 | 295.54 | 0.00 | 11 | | 33.59 | 323.00 | 0.00 |
| 4/25/2014 | 329.09 | 0.00 | 12 | | 329.12 | 356.56 | 0.00 |
| 4/26/2014 | 0.00 | 0.00 | 13 | Y | 658.22 | 0.00 | 0.00 |
| 4/27/2014 | 0.00 | 0.00 | 14 | Y | 658.22 | 0.00 | 0.00 |
| 4/28/2014 | 440.79 | 0.00 | 15 | | 658.22 | 468.25 | 0.00 |
| 4/29/2014 | 266.20 | 0.00 | 16 | | 1099.01 | 293.66 | 0.00 |
| 4/30/2014 | 112.62 | 0.00 | 17 | | 1365.20 | 140.08 | 0.00 |

| Inputs | | | Calculation | | | | |
|---|---|---|---|---|---|---|---|
| Calendar Date | Contractual Cash Outflow | Contractual Cash Inflow | Day from As of Date | Holiday Indicator | Cumulative Cash Outflow (Post inaccessibility period) | Post Assumption Cash Outflow | Post Assumption Cash inflow |
| 5/1/2014 | 289.16 | 0.00 | 18 | | 1477.82 | 316.63 | 0.00 |
| 5/2/2014 | 289.60 | 0.00 | 19 | | 1766.98 | 317.06 | 0.00 |
| 5/3/2014 | 0.00 | 0.00 | 20 | Y | 2056.58 | 0.00 | 0.00 |
| 5/4/2014 | 0.00 | 0.00 | 21 | Y | 2056.58 | 0.00 | 0.00 |
| 5/5/2014 | 319.72 | 0.00 | 22 | | 2056.58 | 0.00 | 0.00 |

#### 6.2.3.4 New Business

The new business assumption accounts for both the initial outflows as well as corresponding inflows occurring due to growth in the business represented by Leg 1 and Leg 2. This assumption also accounts for both the outflows and corresponding inflows occurring due to the growth in business represented by Leg 1 and Leg 2.

The New Business assumption category supports the following assumption:

- Deposit Balance Growth (when Based on = Cash Flows)
- Asset Book Growth (when Based on = Cash Flows)
- Liability Book Growth (when Based on = Cash Flows)
- EOP Balance Growth of Assets (when Based on = EOP Balance)
- EOP Balance Growth of Liabilities (when Based on = EOP Balance)

The change is the earlier deposit balance growth assumption is now the new business assumption. In case you select the assumption type as Deposit Balance Growth, select Based On is selected as Cash Flows under this assumption.

These five assumptions have been merged into a single assumption and this how u can cater to each assumption:

- **Deposit Balance Growth (Based on = Cash Flows)**

  Deposits balance refers to the cash in hand and the deposits maintained by the bank with other institutions including the central bank. Increase in deposit balance results in an increased cash inflow in the maturing time bucket. Note: Deposits Balance Growth can either be positive or negative.

- **Asset Book Growth (Based on = Cash Flows)**

  Asset book refers to the balances of loans and advances given by the bank. Increase in the asset balance results in an increased cash outflow in the selected time bucket and corresponding inflows in future time buckets. This assumption accounts for both the initial outflows as well as corresponding inflows occurring due to growth in the business represented by Leg 1 and Leg 2.

- **Liability Book Growth (Based on = Cash Flows)**

  Liability Book Growth refers to the growth in the value of deposits which are maintained by the bank's customers or borrowings that have been taken by the bank. The growth in the value of deposits results in an additional cash outflow in the maturing time bucket. This assumption also accounts for both the outflows and corresponding inflows occurring due to the growth in business represented by Leg 1 and Leg 2.

- **EOP Balance Growth of Assets (Based on = EOP Balance)**

  EOP Asset Balance of Growth assumption estimates new businesses based on the EOP balance of assets. It accounts for both legs of the transactions, that is, inflows as well as outflows.

- **EOP Balance Growth of Liabilities (Based on = EOP Balance)**

  EOP Liability Balance Growth assumption estimates new businesses based on the EOP balance of liabilities. It accounts for both legs of the transactions, that is, inflows as well as outflows.

Refer section New Business for information on the steps involved in specifying this assumption.

The steps involved in applying the delay in cash flow timing assumption to cash flows are as follows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.
b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.
c. If time specific or critical obligation, record the delay and indicate a breach.

Various options for cash flow assignment are available. Refer section Cash Flows.

An illustration for Asset Book Growth is as follows:

| **Business Assumption Definition** | | | | | | **Cash Flow Assignment** | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Product Type** | **Legal Entity** | **Primary Bucket** | **Off-set Bucket** | **Growth** | **Off-set value** | **Contractual Cash flow (Primary Bucket)** | **Revised Contractual Cash flow (Primary bucket)** | **Contractual Cash flow (Off-set Bucket)** | **Revised Contractual Cash flow (Off-set Bucket)** |
| Loans | LE1 | 3-3 Days | 60-60 Days | 15% | 60% | 20000 | 17000 [=20000-(20000*15%)] | 25000 | 26800 [= (20000*15%*60%)+25000] |
| | | | 90-90 Days | | 20% | | | 27000 | 27600 [= (20000*15%*20%)+27000] |
| | | | 120-120 Days | | 20% | | | 32000 | 32600 [= (20000*15%*20%)+32000] |

**Table 19 Incremental Cash Flow – New Business Example 1**

Here,

**Outflow Amount = Cash Flow * Growth %**

**Inflow Amount = Outflow Amount * Inflow %**

An example for Liability Book Growth is as follows:

| **Business Assumption Definition** | | | | | | **Computation** | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Product Type** | **Legal Entity** | **Primary Bucket** | **Off-set Bucket** | **Growth** | **Off-set value** | **Contractual Cash flow (Primary Bucket)** | **Revised Contractual Cash flow (Primary bucket)** | **Contractual Cash flow (Off-set Bucket)** | **Revised Contractual Cash flow (Off-set Bucket)** |
| Deposits | LE1 | 3-3 Days | 4-4 Days | 25% | 60% | 20000 | 25000 [= 20000+( 20000*25%)] | 25000 | 22000 [=25000-(20000*25%*60%)] |
| | | | 5-5 Days | | 40% | | | 32000 | 30000 [=32000-(20000*25%*40%)] |

**Table 20 Incremental Cash Flow – New Business Example 2**

Here,

**Inflow Amount = Cash Flow * Growth %**

**Outflow Amount = Inflow Amount * Outflow %**

**Note**:

1. With reference to columns titled “Cash Flow”, if the value is positive, it is a cash inflow. If the value is negative, it will be a cash outflow.
2. ‘Contractual cash flow- Primary' and 'Contractual cash flow- Secondary' refers to cash flows which are already present in the respective buckets. Similarly, revised column represents cash flows after application of this business assumption.
3. The cash flow signage explanation provided before holds good for both asset growth and liability growth.
4. In case of a liability growth, i.e. deposits, a growth from the bank's perspective means that there will be an inflow of funds first (bank receives deposits from customer first) and then there will be a corresponding outflow later (Bank returns deposit proceeds on maturity to customer). The converse holds good for asset growth. Note that the first transaction bucket is always the primary bucket. In the example

above on deposits, 3-3 days is defined as a primary bucket i.e. the first bucket where in this case, since it is a liability would result in an inflow in this bucket. The offset bucket will have an outflow.

5. The growth amount (delta) in the primary buckets and the offset buckets would be the same. For example: In the example on deposits above, growth amount in primary bucket is 5000 (25% of 20000). The offset buckets have an amount of 5000 which is the sum of 3000 and 2000.

#### 6.2.3.5 Ratings Downgrade

This assumption supports both rating based and notch based downgrade. These downgrades are specified for each legal entity within the bank's organization structure. This can come from multiple sources like Moody's, S&P and can be both short term and long term or a combination thereof. Since these rating downgrades are defined at a legal entity level, legal entity is a mandatory dimension for this assumption. If the downgrade is same across all legal entities, no individual legal entity is required to be selected.

For some financing transactions or derivatives with embedded triggers for downgrade, a downgrade of the bank's rating by a recognized credit rating institution requires the bank to post additional collateral. This will result in an increase in cash outflow for all the accounts that are triggered based on the corresponding downgrade impact amount and downgrade impact value specified by the bank. The downgrade trigger and the corresponding downgrade impact amount are available as part of the account information. For calculation of downgrade impact amount refer to the OFS LRM Regulatory Calculations User Guide Release 8.0.6.0.0 on OHC documentation Library, *Chapter 2.2 Modified Liquidity Coverage Ratio Calculations*, section *Other Calculations.*

**NOTE:** The assumption specification and computation method for this sub category corresponds to that available as part of the Additional Collateral - Rating Downgrade Cash Flow Increase assumption type. This assumption is renamed as Ratings Downgrade in this version.

Refer section Ratings Downgrade for information on the steps involved in specifying this assumption.

The steps involved in applying the delay in cash flow timing assumption to cash flows are as follows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.
b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.
c. If time specific or critical obligation, record the delay and indicate a breach.

Cash flow assignment is done in the following manner:

$$\text{Cash Flow}_{\text{for Bucket n}} = \left(\text{Downgrade Impact Amount}_{\text{of the particular account which is triggered}} * \text{Percentage Specified}\right) \text{ OR (Amount Specified)}$$

The following example illustrates the impact of a notch based downgrade. Suppose legal entity 1 has 3 accounts whose downgrade triggers are specified as follows:

| Account | Rating Type | Rating Source | Downgrade Trigger | Trigger Type | Impact Amount |
|---|---|---|---|---|---|
| Account 1 | Short Term | Moody's | P-3 | And | 1000000 |
| | Long Term | Moody's | A3 | Or | |
| | Long Term | S&P | A- | | |
| Account 2 | Short Term | Moody's | P-2 | And | 250000 |
| | Long Term | S&P | BBB+ | | |
| Account 3 | Short Term | Internal | A-3 | Or | 3000000 |
| | Long Term | Moody's | Baa2 | | |
| Account 4 | Long Term | Moody's | Baa1 | | 750000 |
| Account 5 | Short Term | Moody's | P-2 | | 1250000 |

The downgrade assumption is specified as follows:

| Rating Type | Rating Source | Downgrade Trigger | Impact % | Time Bucket |
|---|---|---|---|---|
| Short Term | Moody's | 2-Notches | 100% | 7 Days |
| Long Term | Moody's | 3-Notches | | |

The new rating post downgrade is assessed as follows:

| Rating Type | Rating Source | Current Rating | Rating post Downgrade |
|---|---|---|---|
| Short Term | Moody's | P-1 | P-3<br>[= P-1 – 2 Notches] |
| Long Term | Moody's | Aa3 | A3<br>[= Aa3 – 3 Notches] |

The impact of the downgrade assumption, considering weekly time buckets, is calculated as follows:

| Account | Applicability of Assumption | Reason | Cash Outflow / Encumbrance | Outflow Bucket |
|---|---|---|---|---|
| Account 1 | Applicable | Both parts of the first condition are fulfilled. The second condition is Or, hence not required to be fulfilled if the first one is. | 1000000<br>[=1000000*100%] | 5 – 5 Week<br>[=(7+15 Days)/5 Business Days] |
| Account 2 | Not Applicable | The second part of the condition is not fulfilled. | | |
| Account 3 | Not Applicable | Either of the conditions is not fulfilled. | | |
| Account 4 | Not Applicable | The condition is not fulfilled | | |
| Account 5 | Applicable | The condition is fulfilled as the quantum of downgrade specified as part of the assumption is greater than the downgrade trigger set for this instrument. | 1250000<br>[=1250000*100%] | 3 – 3 Week<br>[=(7+5 Days)/5 Business Days] |

The total impact of this assumption is a cash outflow or asset encumbrance of 2250000.

**Table 21 Incremental Cash Flow - Ratings Downgrade**

#### 6.2.3.6 Run-off

Incremental Cash Flow Run-off is applied to the End of Period (EOP) balances indicating the amount that are withdrawn prior to their scheduled maturity. The computation methodology has one additional step that is, if cash flows exist for the dimension combination for which Run-off is specified, they are deleted and then the new cash outflows are generated.

Refer section Run-Off for information on the steps involved in specifying this assumption.

The steps involved in applying the delay in cash flow timing assumption to cash flows are as follows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.
b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.
c. If time specific or critical obligation, record the delay and indicate a breach.

For instance incremental cash flow Run-off is applied to Time Deposits whose EOP balance is $ 10000. The assumption is applied on original balance to selected time buckets as follows:

| **Business Assumption Definition** | | | **Cash Flow Assignment** | | |
|---|---|---|---|---|---|
| **Product Type** | **To Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Revised Cash Flow** |
| Time Deposits | 1-7 Days | 10% | 5000 | 1-7 Days | 1000 [=5000 – 5000 +10000*10%] |
| | 8-15 Days | 20% | 8000 | 8-15 Days | 2000 [=8000 – 8000 +10000*20%] |

**Table 22 Incremental Cash Flow – Run-Off**

#### 6.2.3.7 Secured Funding/Financing

This assumption is based on debt backed or secured by collateral securities associated with lending. This assumption category refers to the generation of secured funding or creation of secured financing transactions including secured loans, repos and so on. An example would be a mortgage, your house is considered collateral towards the debt. If you default on repayment, the bank seizes your house, sells it and uses the proceeds to pay back the debt.

Functionally, this assumption is similar to the new business assumption except for the inclusion of the underlying collateral and encumbrance status into picture.

**NOTE:**

- Assets can only be posted as collateral or specified as underlying only if they are unencumbered during the period between the Primary and Off-set bucket.

- The ability to filter assets based on their encumbrance period is supported.

The following steps are involved in applying the secured funding/financing assumption to cash flows:

1. Map inflows and outflows of the transaction to respective time buckets.
2. Calculate the corresponding interest amount.
3. Mark the assets selected as collateral/underlying as encumbered and update the encumbrance period.

Refer section Secured Funding/Financing for information on the steps involved in specifying this assumption.

For example: If a bank is giving out an additional loan with reference to an existing loan by taking in some collateral. This is an example of a secured funding transaction, as the bank receives collateral in exchange for the cash given out. Let's assume that the outstanding end of period balance of the original loan is 10,000. The bank extends another 10% of the loan by taking in a collateral against it say Borrow_1. Further the 10% being extended is completely offset as a bullet payment in a single bucket (100% in offset bucket).

The above scenario is defined in the business assumption as follows:

| **Business Assumption Definition** | | | | | | |
|---|---|---|---|---|---|---|
| **Standard product type** | **Primary bucket** | **Primary value-leg 1** | **Offset bucket** | **Offset value- leg 1** | **Collateral/underlying** | **Encumbered value** |
| Loans | 7-7 days | 10 | 15-15 days | 100 | Borrow_1 | 50% |

**Table 23 Incremental Cash Flow – Secured Funding/Financing**

**Note**: 1. Refer section Secured Funding/Financing for information on the steps involved in specifying this assumption.
2. The encumbered value represents the portion of the collateral which is used to secure the loan.

The cash flow computation for the above definition is explained as follows:

| **Buckets** | | **Cash flow** | |
|---|---|---|---|
| | | **Contractual** | **BaU** |
| Primary bucket | 7-7 days | 5000 | 4000<br>(5000- (10%*10000) |
| Offset bucket | 15-15 days | 8000 | 9000<br>(8000+(10%*10000) |

Given that the example is based on loans, the primary leg involves a deduction in cash and the secondary leg involves an addition in cash flow. The deduction/addition will be reverse in nature if the product type is an asset. The application identifies whether to deduct/add in primary bucket and offset bucket based on the product type chosen.

### 6.2.3.8 Valuation Changes

This assumption supports changes in the value of the collateral posted due to changes in market valuation of transaction or changes in the contract value. This further leads to cash outflow.

This assumption impacts the denominator of LCR that is, increase in the outflow for the Legal Entity.

Some derivatives are secured by collateral to cover losses arising from changes in mark-to-market valuations. For changes in the value of the derivative, additional collateral is posted resulting in a cash outflow. The valuation changes can be with Natural currency or Selected Currency. Valuation changes can be specified in Amount or Percentage. Here, both ratings and notches downgrade are not applicable.

The time buckets selected as part of the assumption parameters are the impacted time buckets.

**NOTE:** The assumption specification and computation method for this sub category corresponds to that available as part of the Additional Collateral - Valuation Changes assumption type. This assumption is renamed as Valuation Changes in this version.

Refer section Valuation Changes for information on the steps involved in specifying this assumption.

The steps involved in applying the delay in cash flow timing assumption to cash flows are as follows:

a. Identify the original time bucket and calculate the cash outflow occurring in it due to the assumption.

b. Identify the corresponding revised time buckets and the cash inflow occurring in it, including penalties, if any.

c. If time specific or critical obligation, record the delay and indicate a breach.

An example is as follows:

| Based On | Assumption Unit | Assignment Method |
|---|---|---|
| Market Value | Percentage | Selected |

| Legal Entity | Product Type | Time Bucket | Valuation Change Impact |
|---|---|---|---|
| LE 1 | PT 1 | 6-6 Days | 100% |
| LE 2 | PT 1 | 6-6 Days | 80% |

| Account | Legal Entity | Product Type | Market Value | Valuation Change Impact |
|---|---|---|---|---|
| Account 1 | LE 1 | PT 1 | 100000 | 100000 [=100% *100000] |
| Account 2 | LE 2 | PT 1 | 200000 | 160000 [=80%*200000] |
| Account 3 | LE 1 | PT 1 | 300000 | 300000[=100%*300000] |
| Account 4 | LE 2 | PT 1 | 400000 | 320000[=80%*400000] |

| Legal Entity | Product Type | Outflow |
|---|---|---|
| LE 1 | PT 1 | 400000[=100000 + 300000] |
| LE 2 | PT 1 | 480000[=160000+ 320000] |

**Table 24 Incremental Cash Flow - Valuation Changes**

**NOTE:** Each of these does not calculate the impact of interest and have been explained in a principle perspective.

The examples provided for business assumption do not illustrate the impact of interest cash flows.

For information on interest cash flow calculations from the perspective of assumptions, refer section Impact of Assumptions on Interest Cash Flows.

The example depicted in the section depicts only the additional outflow (delta) in the respective buckets due to the application of the assumption.

## 6.2.4 Value Change

### 6.2.4.1 Available Stable Funding Factor

Available stable funding (ASF) factors are the multiplication factors specified for liabilities and equities for the purpose of calculating the Net Stable Funding Ratio (NSFR). This business assumption allows you to specify the ASF factor in percentage terms only. The percentage specified is applied to the selected combination in order to calculate the NSFR.

Refer section Available Stable Funding Factor for information on the steps involved in specifying this assumption. In the following example ASF factor is applied on EOP balances for a selected list of products and the resulting ASF amounts are calculated.

| **Business Assumption Definition** | | **Balance Assignment** | |
|---|---|---|---|
| **Product** | **ASF Factor** | **EOP Balance** | **Available Stable Funding** |
| P1 | 85% | 10000000 | 8500000<br>[=(1000000*85%)] |
| P 2 | 100% | 200000 | 200000<br>[=(200000*100%)] |
| Term deposits from retail | 90% | 320000 | 288000<br>[=(320000*90%)] |
| Unsecured funding from non-financial corporates | 50% | 21000 | 10500<br>[=(21000*50%)] |

**Table 25 Value Change - Available Stable Funding Factor**

### 6.2.4.2 Haircut

Haircuts are applied to high quality liquid assets in order to determine the stock of high quality liquid assets. This assumption does not affect the cash flows. Haircuts are allowed to be specified in percentage terms only. The haircut percentage specified will be applied to all assets with the dimensional attributes specified in order to calculate the stock of high quality liquid assets for the purpose of computing the Liquidity Coverage Ratio (LCR).

Refer section Haircut for information on the steps involved in specifying this assumption

| **Business Assumption** | | |
|---|---|---|
| **Product Type** | **Asset Level** | **Haircut** |
| Cash | Level 1 | 0% |
| Covered bond | Level 1 | 0% |
| Covered bond | Level 2A | 15% |
| Common Equity | Level 2B | 50% |

**Table 26 Value Change – Haircut**

The assumption stores these haircuts at the account level granularity for further use while calculating the stock of HQLA for the purpose of LCR computation. The application then computes the haircut adjusted values of assets for inclusion in the stock of HQLA as follows:

| Product Type | Asset Level | Haircut | Market Value | Haircut Adjusted Market Value |
|---|---|---|---|---|
| Cash | Level 1 | 0% | 3000000 | 3000000<br>[=30000000*(1-0%)] |
| Covered bond | Level 1 | 0% | 220000 | 187000<br>[=220000*(1-15%)] |
| Covered bond | Level 2A | 15% | 550000 | 412500<br>[=550000*(1-25%)] |
| Common Equity | Level 2B | 50% | 110000 | 55000<br>[=110000*(1-50%)] |

### 6.2.4.3 Required Stable Funding Factor

Required stable funding factors are the multiplication factors specified for assets for the purpose of calculating the NSFR. This assumption allows you to specify the amount in percentage only. The percentage specified is applied to the selected combination in order to calculate the Net Stable Funding Ratio (NSFR).

Refer section Required Stable Funding Factor for information on the steps involved in specifying this assumption. In the following example RSF factor is applied on EOP balances for a selected list of products and the resulting RSF amounts are calculated.

| Business Assumption | | Computation | |
|---|---|---|---|
| **Product** | **RSF Factor** | **EOP Balance** | **Required Stable Funding** |

| Business Assumption | | Computation | |
|---|---|---|---|
| **Product** | **RSF Factor** | **EOP Balance** | **Required Stable Funding** |
| Non-renewable loans to financial entities and financial corporates | 0% | 200000 | 0 [= (200000*0%)] |
| Gold | 50% | 150000 | 75000 [= (150000*50%)] |
| Corporate bonds rated A+ to A- | 40% | 220000 | 0 [= (220000*40%)] |

**Table 27 Value Change - Required Stable Funding Factor**

## 6.3 Intraday Business Assumptions Supported

The application supports the following types of intraday business assumptions:

a. Cash Flow Movement
   - Time Shift in Payments
   - Payments Default

b. Encumbrance
   - Withdrawal of Credit Lines

c. Incremental Cash Flow
   - Intraday Drawdown
   - Large Unexpected Payments

d. Value Change
   - Intraday Valuation Changes

The computations related to each assumption category and sub-category is explained in detail, in the following sections.

## 6.3.1 Cash Flow Movement

### 6.3.1.1 Time Shift in Payments

When a bank is under financial stress, customers and counterparties defer payments, leading to a reduction in Intraday liquidity. The delayed payments, affect other payments in the pipeline and also effect the fulfillment of time specific obligations.

In a similar way, when certain obligations of the bank are brought forward in time during the day, this leads to a stressed situation as well. The assumption supports a time shift in payments- either a forward or backward shift.

The application supports a time shift of payments from one time bucket to another. You can apply this assumption to both payments made and payments received.

**NOTE:** All payments within the time bucket are affected and shifted according to the assumption definition.

The following is an example for Time Shift in Payment assumption category:

The Time buckets are defined as follows in the example:

| Level 2 | Level 1 | Level 0 |
|---|---|---|
| 09:00:00 to 09:24:00 | 09: 00:00 to 09:12:00 | 09:00:00 to 09:06:00 |
| | | 09:06:01 to 09:12:00 |
| | 09:12:01 to 09:24:00 | 09:12:01 to 09:18:00 |
| | | 09:18:01 to 09:24:00 |

When a Business Assumption is defined:

- Dimensions: Legal entity- Payment system
- Based on: Payments received

- Time buckets from : 09:00:00 to 09:12:00
- Time buckets To: 09:12:01 to 09:24:00
- Percentage of delay: 60%

The payments made and received are as follows:

| Time bucket (Level 0) | Payments Received (Inflows) | Payments Made (Outflows) |
|---|---|---|
| | Amount | Amount |
| 09:00:00 to 09:06:00 | 990 | 675 |
| 09:06:01 to 09:12:00 | 550 | 234 |
| 09:12:01 to 09:18:00 | 130 | 167 |
| 09:18:01 to 09:24:00 | 100 | 389 |

When the assumption is defined at level 1, the same is translated to level 0 buckets when the assignment method is selected.

In the above example, the selected time bucket option as an assignment metod is chosen. In this case, Inflows in the time period 09:00:00 to 09:12:00 moves to the time bucket 09:12:01 to 09:24:00. Since the 'to' bucket has two level 0 buckets, the assignment of the total amount i.e. (990 +550) must be done to both the buckets. After the assignment, the payments received and made are as follows:

| Time bucket | Payments Received (Inflows) | Payments Made (Outflows) |
|---|---|---|
| | Amount | Amount |
| 09:00:00 to 09:06:00 | 396 | 675 |

| Time bucket | Payments Received (Inflows) | Payments Made (Outflows) |
|---|---|---|
| | Amount | Amount |
| 09:06:01 to 09:12:00 | 220 | 234 |
| 09:12:01 to 09:18:00 | 592 | 167 |
| 09:18:01 to 09:24:00 | 562 | 389 |

Here, 60% of (990 +550) is delayed and is allocated equally between the level 0 buckets in the to bucket.

#### 6.3.1.2 Payments Default

In this assumption, certain risky counterparties are assumed to default on their payments. Here, incoming payments from the respective counterparty type reduces to an extent as specified in the assumption definition. The counterparty is chosen through a dimensional selection.

For example, consider the following payments made and received for a legal entity- payment system combination.

| Time stamp | Payments Received | | Payments Made | |
|---|---|---|---|---|
| | Payments | Counterparty Type | Payments | Counterparty Type |
| 9:00 | 100 | A | | |
| 9:15 | 30 | A | 40 | C |
| 9:30 | | | 90 | C |
| 9:45 | 60 | A | 150 | B |
| 10:00 | 30 | C | 100 | B |
| 10:15 | 90 | B | 300 | A |

| Time stamp | Payments Received | | Payments Made | |
|---|---|---|---|---|
| | Payments | Counterparty Type | Payments | Counterparty Type |
| 10:30 | 45 | | | |
| 10:45 | 89 | B | 70 | D |
| 11:30 | 90 | C | 100 | B |
| 12:00 | 56 | C | 90 | E |
| 12:15 | | | 70 | E |
| 12:30 | 78 | A | 100 | B |
| 13:15 | | | 20 | C |
| 13:30 | 96 | E | | |
| 14:30 | 200 | E | 200 | D |
| 15:00 | 250 | A | | |
| 15:15 | 300 | B | 87 | D |
| 15:30 | 60 | B | 40 | E |
| 15:45 | | | | |
| 16:00 | 50 | E | 99 | A |
| 16:15 | | | 60 | B |
| 16:30 | 40 | D | | |
| 16:45 | | | | |
| 17:00 | | | | |

Assuming that one of the counterparty types A is in complete default (100%). This means that the incoming payment from A reduces to zero. The payments to be received by A flows normally. The new set of Inflows and Outflows are as follows:

| Time stamp | Payments Received | | Payments Made | |
|---|---|---|---|---|
| | Payments | Counterparty | Payments | Counterparty |
| 9:00 | | A | | |
| 9:15 | | A | 40 | C |
| 9:30 | | | 90 | C |
| 9:45 | | A | 150 | B |
| 10:00 | 30 | C | 100 | B |
| 10:15 | 90 | B | 300 | A |
| 10:30 | 45 | | | |
| 10:45 | 89 | B | 70 | D |
| 11:30 | 90 | C | 100 | B |
| 12:00 | 56 | C | 90 | E |
| 12:15 | | | 70 | E |
| 12:30 | | A | 100 | B |
| 13:15 | | | 20 | C |
| 13:30 | 96 | E | | |
| 14:30 | 200 | E | 200 | D |
| 15:00 | | A | | |
| 15:15 | 300 | B | 87 | D |
| 15:30 | 60 | B | 40 | E |

| Time stamp | Payments Received | | Payments Made | |
|---|---|---|---|---|
| | Payments | Counterparty | Payments | Counterparty |
| 15:45 | | | | |
| 16:00 | 50 | E | 99 | A |
| 16:15 | | | 60 | B |
| 16:30 | 40 | D | | |
| 16:45 | | | | |
| 17:00 | | | | |

In the above example, the counterparty is in complete default.

However a partial default in payments can also be defined. This can be defined by using the Assumption Unit in the Business Assumptions window. This consists of two options, Percentage and Value.

In case of a partial default, the remaining payments need to be shifted to a 'Residual' time bucket. If this bucket is specified at a higher level, the remaining payments are dispersed equally among the lower level buckets.

Examples: If Assumption unit is in %, and 70% is the specified value, then 70% of the payments of the particular counterparty type is defaulted. The remaining 30% of payments is redistributed in the residual time bucket equally

**Note**:

1. The assignment method in payments default is only Selected time bucket.
2. When Assignment unit= value, the value specified is the value defaulted by the specific dimensional combination
3. By default, if no value/percentage is given, the assumption unit appears as 0 for the possible dimensional combinations.
4. Residual time bucket is within the from time bucket or outside it.

For example, from 11:00:00 to 12:00:00; residual bucket: 11:45:00- 12:00:00

Or from bucket: 12:00:00 to 13:00:00 ; residual bucket: 14:15:00-14:30:00

The metrics affected by this assumption are as follows:

- Daily Maximum Intraday Liquidity Usage
- Total Payments
- Throughput

## 6.3.2 Encumbrance

### 6.3.2.1 Withdrawal of Credit Lines

This assumption is a specific case when a bank is under financial stress, counterparties and correspondent banks may withdraw intraday credit lines, thus reducing the intraday liquidity available to the bank. The direct impacts of this assumption is on non-committed credit lines; since they can be withdrawn completely.

This withdrawal of Credit Lines is expected at the start of the day. When credit lines are withdrawn, the available intraday liquidity at the start of the day reduces by the same extent.

The metric which impacts due to this effect is ‘Available Intraday Liquidity at the start of the business day’.

| SL. No | Sources |
|---|---|
| 1 | Central Bank reserves |
| 2 | Collateral pledged at central bank |
| 3 | Collateral pledged at ancillary systems |
| 4 | Unencumbered liquid assets on the balance sheet |
| 5 | Total credit lines available |
| 5a | Of which secured |
| 5b | Of which committed |

| SL. No | Sources |
|---|---|
| 6 | Balances with other banks |
| 7 | Other |

In this assumption, the depending on the dimension selected, the intraday credit lines are reduced by the extent of the withdrawal.

### 6.3.3 Incremental Cash Flow

#### 6.3.3.1 Intraday Drawdown

This assumption enables banks to provide correspondent banking services only. The payment system participants value intraday credit on electronic funds transfer networks because payments and receipts are not perfectly synchronized. In addition, it eliminates the necessity of holding clearing balances large enough to cover all expected outflows of funds.

When a customer bank is in stress, to maintain adequate liquidity, the customer may resort to excessive drawdown of Intraday credit lines.

In the following example, the correspondent bank has 5 customers. Under normal conditions, credit lines extended to customers and usage are as follows:

| Normal Conditions | | | | | | |
|---|---|---|---|---|---|---|
| **Financial Institution Customer** | **Intra-day Credit Line Extended** | **Intraday Usage** | **Secured** | **Committed** | **Usage of Secured** | **Usage of Committed** |
| Bank O | 85 | 70 | 40 | 50 | 31 | 21 |
| Bank E | 80 | 60 | 25 | 10 | 26 | 30 |
| Bank M | 45 | 30 | 30 | 40 | 21 | 6 |
| Bank G | 35 | 25 | 30 | 30 | 12 | 13 |
| Bank Z | 30 | 20 | 15 | 20 | 12 | 17 |

| **Normal Conditions** | | | | | | |
|---|---|---|---|---|---|---|
| **Financial Institution Customer** | **Intra-day Credit Line Extended** | **Intraday Usage** | **Secured** | **Committed** | **Usage of Secured** | **Usage of Committed** |
| TOTAL | 275 | 205 | 140 | 150 | 102 | 87 |

One or more of the customer banks may be under stress, due to which maximum drawdown of Intraday credit lines may occur. The application supports following dimensional inputs:

1. Percentage of Drawdown
2. Respective Customers

In the above example, two customer banks are assumed to be under stress-Bank E, Bank O. Under this example, 100% drawdown of credit lines by the customer is assumed. Hence the credit lines extended and used under stressed conditions are as follows:

| Stress Conditions | | | | | | |
|---|---|---|---|---|---|---|
| **Financial Institution Customer** | **Intra-day Credit Line Extended** | **Intraday Usage** | **Secured** | **Committed** | **Usage of Secured** | **Usage of Committed** |
| Bank O | 85 | 85 | 40 | 50 | 40 | 50 |
| Bank E | 80 | 80 | 25 | 10 | 25 | 10 |
| Bank M | 45 | 30 | 30 | 40 | 21 | 6 |
| Bank G | 35 | 25 | 30 | 30 | 12 | 13 |
| Bank Z | 30 | 20 | 15 | 20 | 12 | 17 |
| TOTAL | 275 | 240 | 140 | 150 | 110 | 96 |

Similarly, the application computes 'Peak Usage' for both normal conditions and stressed conditions.

When a drawdown assumption is applied at higher level of time buckets, a single assignment within any level zero buckets of the said amount is considered. An example is as follows:

- Primary bucket (level 3): 08:00 – 09:00, level zero buckets being minutes
- Offset Bucket (Level 3):16:00- 17:00
- Available balance: 1000, assumption value= 40%

An amount of 400 is the outflow in the primary bucket and an inflow in the offset bucket for banks providing credit lines to its customers. This amount is allocated as a single amount in any level zero time bucket which constitutes primary and offset buckets; like 08:03( outflow 400) and 16:06( inflow 400) ;or 08:44 (outflow 400) and 16:02 (inflow 400).

#### 6.3.3.2 Large Unexpected Payments

This assumption allows introduction of unforeseen large payments in usual working day.The large payments can be either receipts or obligations or both. Introduction of large payments suddenly within the bank's payment system causes a scenario of liquidity stress

whereby the bank has to arrange such funds in very short notice. The assumptions allows the user to specify the payment system affected, the time bucket at which the payment(s) is introduced and the amount. The amounts introduced are included in the time buckets as specified in the assumption.

As with other intraday assumptions, all the intraday metrics are calculated post application of the assumption through a Stress Run.

The following is an example for this assumption:

This example contains actual payments made through a particular payment system and the impact of the introduction of a large payment within the other payments.

Actual payments with time stamp are as follows:

| Payments made | Payment system | Time stamp | Time bucket - 15 minutes |
|---|---|---|---|
| 568 | PS 1 | 12:08 | 12:01-12:15 |
| 876 | PS 1 | 12:09 | 12:01-12:15 |
| 654 | PS 1 | 12:12 | 12:01-12:15 |
| 655 | PS 1 | 12:30 | 12:16-12:30 |
| 673 | PS 1 | 12:31 | 12:31-12:45 |
| 890 | PS 1 | 12:32 | 12:31-12:45 |
| 123 | PS 1 | 12:44 | 12:31-12:45 |
| 876 | PS 1 | 12:45 | 12:31-12:45 |

Time bucket is defined as follows:x

- Level 0: 1 minute
- Level 1: 15 minutes interval.

The bucketed payments at level 1 are as follows:

| Time bucket | Payments made |
|---|---|
| 12:01-12:15 | 2098 |
| 12:16-12:30 | 655 |
| 12:31-12:45 | 2562 |

Business assumption is defined as follows:

- Based on: Payments made
- Payment system: PS1
- Time bucket: Level 1- 12:16 to 12:30
- Amount: 6765

The new bucketed payments after the application of the assumption are as follows:

| Time bucket | Payments made |
|---|---|
| 12:01-12:15 | 2098 |
| 12:16-12:30 | 7420 |
| 12:31-12:45 | 2562 |

The new payment can be introduced at any level of time bucket. In the above example, it is introduced in Level 1 of the definition.

### 6.3.4 Value Change

#### 6.3.4.1 Intraday Valuation Changes

In cases of particular currency shocks or in a market wide stress scenario, the value of the intraday assets held by the bank reduces to a certain extent. This assumption is applicable for all reporting banks.

The metric affected as a part of this assumption is “Available Intraday Liquidity at the start of the business day”.

This assumption takes into account the particular intraday asset and the percentage amount by which it must be reduced. The legal entity under which the asset is held is considered.

This assumption works on all available intraday assets which constitute the metric “ Available Intraday Liquidity at the start of the business day” except credit lines.

**The following is an example for this assumption:**

| Legal Entity | Product | Percentage |
|---|---|---|
| LE1 | Product 1 | 70% |
| LE2 | Product 2 | 80% |

The above valuation change is explained as follows:

- Product 1 is reduced to 30% of its prior value.
- Product 2 is reduced to 20% of its total value.

## 6.4 Impact of Assumptions on Interest Cash Flows

In 2.0 the impact of business assumptions was only on principal cash flows. OFS LRM considers the impact on both principal and interest cash flows. This is treated in following three ways:

- When business assumption values are applied on both principal and interest cash flows.
- When assumption values are applied on principal cash flows only and interest is approximated.
- When interest is calculated and is not approximated.

When you select the approximate Interest parameter in the Run Definition window as Yes, then interest is approximated as explained below. If the parameter is selected as No, then the assumption values are applied on both principal and interest cash flows.

The following are the steps involved in approximating interest:

1. Obtain the principal and interest cash flows under contractual terms.
2. Bucket the contractual cash flows based on the time buckets selected while distinguishing between interest and principal cash flows in each time bucket.
3. Calculate the outstanding balance in each bucket under contractual terms. The outstanding balance in the first time bucket will be the EOP balance. The formula for calculating the outstanding balance for each subsequent bucket is as follows:

$$O/S\ Balance_{Bucket\ n,Contractual} = O/S\ Balance_{Bucket\ n-1,Contractual} - Principal\ CF_{Bucket\ n-1,Contractual}$$

Here,

O/S Balance: Outstanding Balance

CF: Cash Flows

4. Apply the business assumption to estimate principal cash flows. In case of balance based assumptions, this applies to the EOP balance. In case of cash flow based assumptions, this applies to the principal cash flows in a given bucket.

5. Calculate the outstanding balance in each bucket under business-as-usual or stress terms. The outstanding balance in the first time bucket will be the EOP balance. The formula for calculating the outstanding balance for each subsequent bucket is as follows:

$$O/S\ Balance_{Bucket\ n,Assumption} = O/S\ Balance_{Bucket\ n-1,Contractual} - Principal\ CF_{Bucket\ n-1,Contractual} - \sum_{i=0}^{n-1} Principal\ CF_{i,Assumption}$$

6. Calculate the proportionate impact on interest cash flows in each bucket under business-as-usual or stress terms as per the following formula:

$$Interest\ CF_{Bucket\ n,Assumption} = \left(\frac{O/S\ Balance_{Bucket\ n-1,Assumption} \times Interest\ CF_{Bucket\ n-1,Contractual}}{O/S\ Balance_{Bucket\ n-1,Contractual}}\right) - Interest\ CF_{Bucket\ n-1,Contractual}$$

7. Calculate the total principal and interest cash inflows and outflows in each time bucket post assumption.

8. Calculate the total inflows, outflows and net gap in each time bucket post assumption.

**NOTE:** This computation is not applicable for the assumption types Rollover of Repos and Reverse Repos and Creation of Repos as the interest calculations are explicitly defined in these cases.

The tables below explain the impact of assumptions on Interest Cash Flows. The standard time buckets are Overnight, 1-7 Days, 8-15 Days, 16-30 Days, 1-3 Months, 3-6 Months, 6-12 Months, and > 1 Year. All examples consider an EOP balance of 5000 for time deposits.

**Example 1: Impact on Interest Cash Flows under Growth Assumption**

In this case a growth of 10 % on the EOP balance is defined in the 8-15 Days bucket. The offset bucket for this growth is a single bucket at 3-6 months. The cash flows are as shown below. The numbers for Contractual Principal and Interest cash flow are examples. The rest of the rows are computed values as per equations provided earlier in this section.

| Condition | Measure | Cash Outflow | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Overnight | 1-7 Days | 8-15 Days | 16-30 Days | 1-3 Months | 3-6 Months | 6-12 Months | > 1 Year |
| Contractual | Principal Cash Flow | 221.00 | 195.00 | 244.00 | 283.00 | 163.00 | 263.00 | 257.00 | 3374.00 |
| | Interest Cash Flow | 112.00 | 129.00 | 87.00 | 147.00 | 65.00 | 88.00 | 84.00 | 1477.42 |
| | O/S Balance | 5000.00 | 4779.01 | 4584.00 | 4340.00 | 4057.00 | 3894.00 | 3631.00 | 3374.00 |
| Business Assumption | Principal Cash Flow | | | -500.00 | | | 500 | | |
| | O/S Balance | 5000.00 | 4779.00 | 4584.00 | 4840.00 | 4557.00 | 4394.00 | 3631.00 | 3374.00 |
| | Proportionate Interest Cash Flow | 0.00 | 0.00 | 0.00 | 0.0 | 16.94 | 8.01 | 11.30 | 0 |

**Table 28 Impact on Interest Cash Flows under Growth Assumption**

**NOTE:** The assumption cash flows provide the impact of the assumption only and not the change in the original cash flows due to the assumption.

**Example 2: Impact on Interest Cash Flows under Rollover Assumption**

In this case a rollover of 10% is defined on the cash flows from the 1-7 Days bucket to the 3-6 Months bucket. The cash flows are as shown below. The numbers for Contractual Principal and Interest cash flow are examples. The rest of the rows are computed values as per equations provided earlier in this section.

| Condition | Measure | Cash Outflow | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Overnight | 1-7 Days | 8-15 Days | 16-30 Days | 1-3 Months | 3-6 Months | 6-12 Months | > 1 Year |
| Contractual | Principal Cash Flow | 221.00 | 195.00 | 244.00 | 283.00 | 163.00 | 263.00 | 257.00 | 3374.00 |
| | Interest Cash Flow | 112.00 | 129.00 | 87.00 | 147.00 | 65.00 | 88.00 | 84.00 | 1477.42 |
| | O/S Balance | 5000.00 | 4779.00 | 4584.00 | 4340.00 | 4057.00 | 3894.00 | 3631.00 | 3374.00 |
| Business Assumption | Principal Cash Flow | | -19.50 | | | | 19.50 | | |
| | O/S Balance | 5000.00 | 4779.00 | 4603.50 | 4359.50 | 4076.50 | 3913.50 | 3631.00 | 3374.00 |
| | Proportionate Interest Cash Flow | 0.00 | 0.00 | 0.0 | 0.37 | 0.66 | 0.31 | 0.44 | 0.00 |

**Table 29 Impact on Interest Cash Flows under Rollover Assumption**

**Example 3: Impact on Interest Cash Flows under Run-off Assumption**

In this case, a 10% EOP Balance Run-off is defined from the 3-6 Months bucket to the 1-7 Days bucket. The cash flows are as shown below. The numbers for Contractual Principal and Interest cash flow are examples. The rest of the rows are computed values as per equations provided earlier in this section.

| Condition | Measure | Cash Outflow | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Overnight | 1-7 Days | 8-15 Days | 16-30 Days | 1-3 Months | 3-6 Months | 6-12 Months | > 1 Year |
| Contractual | Principal Cash Flow | 221.00 | 195.00 | 244.00 | 283.00 | 163.00 | 263.00 | 257.00 | 3374.00 |
| | Interest Cash Flow | 112.00 | 129.00 | 87.00 | 147.00 | 65.00 | 88.00 | 84.00 | 1477.42 |
| | O/S Balance | 5000.00 | 4779.00 | 4584.00 | 4340.00 | 4057.00 | 3894.00 | 3631.00 | 3374.00 |
| Business Assumption | Principal Cash Flow | | 500.00 | | | | -500.00 | | |
| | O/S Balance | 5000.00 | 4779.00 | 4084.00 | 3840.00 | 3557.00 | 3394.00 | 3631.00 | 3374.00 |
| | Proportionate Interest Cash Flow | 0.00 | 0.00 | 0 | -9.49 | -16.94 | -8.01 | -11.3 | 0.00 |

**Table 30 Impact on Interest Cash Flows under Run-off Assumption**

When interest is calculated and is not approximated,

In case Include Interest Cash Flow is selected as Yes and Approximate Interest is selected as No, the application includes the interest cashflow. If you have selected cashflow type in dimension and node as Principal then assumption impacts only principal cashflows. If you have selected cashflow type in dimension and node as Interest then assumption impacts only Interest cashflows. In case you have not

selected cashflow type in dimension, then assumption ignores the cashflow type. This means, it will include both principal and interest cash flows.

**NOTE:** Interest cash flows occurring contractually are considered during calculations and the impact of assumptions on interest is calculated under BAU and stress conditions if the option 'Yes' is selected as part of the Include Interest Cash Flows field in the Run Definition window. Refer Run Management Definition section.

## 6.5 Cash Flow Assignment Methodologies

The complete list of cash flow assignment methods are as follows:

1. Selected time bucket only.
2. Equally to all time buckets up to and including the selected bucket.
3. In decreasing order to all time buckets up to and including the selected bucket.
4. In increasing order to all time buckets up to and including the selected bucket.
5. In proportion to the bucket size.

Detailed in the following sections are illustrations for each cash flow assignment method. The standard Level 0 time buckets are Overnight, 1-7 Days, 8-15 Days, 16-30 Days, 1-3 Months, 3-6 Months, 6-12 Months, 1-5 years and > 5 Years. All examples consider an EOP balance of 500000 for time deposits.

**1. Selected Time Bucket**

In this case, the assumption unit is applied to the cash flows and the assumption cash flows are mapped to the time bucket selected. If the assumption is not specified on Level 0 buckets, then the assignment to the lower buckets is done proportionately to the bucket size.

**2. Equal Assignment**

Here cash flows assigned to each bucket are up to the selected bucket. Assignments are made equally to the selected level and further assignment is done till the most granular level. The formulae under different conditions are as follows:

a. EOP Balance Based Assumptions, Assumption Unit = Percentage

$$Cash\ Flow_{Equal,Balance\ Based,\%} = \frac{EOP\ Balance \times Assumption\ \%}{Number\ of\ L0\ Buckets}$$

$$Cash\ Flow_{Equal,Balance\ Based,\%} = \frac{EOP\ Balance \times Assumption\ \%}{Number\ of\ Level\ X\ Buckets}$$

Where,

Level X Buckets: Higher granular buckets

| Business Assumption | | | Cash Flow Assignment | | |
|---|---|---|---|---|---|
| **Product** | **From Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Revised Cash Flow** |
| Time Deposits | 8-15 Days | 5% | 10000 | Overnight | – 2500<br>[= 10000 – {(500000*5%)/2}] |
| | | | 5000 | 1-7 Days | – 7500<br>[= 5000 – {(500000*5%)/2}] |

**Table 31 Equal Assignment under Balance Based Assumptions, %**

b. Cash Flow Based Assumptions, Assumption Unit = Percentage

$$Cash\ Flow_{Equal,CF\ Based,\%} = \frac{Cash\ Flow_n \times Assumption\ \%}{Number\ of\ L0\ Buckets} Cash\ Flow_{Equal,CF\ Based,\%}$$
$$= \frac{Cash\ Flow_n \times Assumption\ \%}{Number\ of\ Level\ X\ Buckets}$$

Where, n: Selected bucket

| Business Assumption | | | Cash Flow Assignment | | |
|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Revised Cash Flow** |
| Time Deposits | 8-15 Days | 5% | 10000 | Overnight | 9800<br>[= 10000 – {(8000*5%)/2}] |
| | | | 5000 | 1-7 Days | 4800<br>[= 5000 – {(8000*5%)/2}] |

**Table 32 Equal Assignment under Cash Flow Based Assumptions, %**

c. Assumption Unit = Value

$$Cash\ Flow_{Equal,\$} = \frac{Assumption\ Value}{Number\ of\ L0\ Buckets}$$

$$Cash\ Flow_{Equal,\$} = \frac{Assumption\ Value}{Number\ of\ Level\ X\ Buckets}$$

| Business Assumption | | | Cash Flow Assignment | | |
|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Revised Cash Flow** |
| Time Deposits | 8-15 Days | 3000 | 10000 | Overnight | 8500<br>[= 10000 – (3000/2)] |
| | | | 5000 | 1-7 Days | 3500<br>[= 5000 – (3000/2)] |

**Table 33 Equal Assignment, Value**

### 3. Proportionate Assignment

Cash flows are assigned to each bucket up to the selected bucket in proportion to the bucket size. Assignments are made proportionately to the selected level and further assignment is done till the most granular level. The formulae under different conditions are as follows:

a. EOP Balance Based Assumptions, Assumption Unit = Percentage

$$\text{CashFlow}_{\text{Proportionate,BalanceBased,\%}} = (\text{EOPBalance} \times \text{Assumption\%}) \times \frac{t}{T}$$

Where,

t: Number of days in the given Level X bucket

T: Total number of days up to the selected bucket

| **Business Assumption** | | | **Cash Flow Assignment** | | |
|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Revised Cash Flow** |
| Time Deposits | 8-15 Days | 5% | 10000 | Overnight | 10000<br>[= 10000 – {(500000*5%)*0/7] |
| | | | 5000 | 1-7 Days | – 20000<br>[= 5000 – {(500000*5%)*7/7] |

**Table 34 Proportionate Assignment under Balance Based Assumptions, %**

b. Cash Flow Based Assumptions, Assumption Unit = Percentage

$$\boldsymbol{Cash\ Flow}_{\boldsymbol{Proportionate\ ,CF\ Based,\%}} = (\boldsymbol{Cash\ Flow}_{\boldsymbol{n}} \times \boldsymbol{Assumption}\ \%) \times \frac{\boldsymbol{t}}{\boldsymbol{T}}$$

| **Business Assumption** | | | **Cash Flow Assignment** | | |
|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Revised Cash Flow** |
| Time Deposits | 8-15 Days | 5% | 10000 | Overnight | 10000<br>[= 10000 – {(8000*5%)*0/7}] |
| | | | 5000 | 1-7 Days | 4600<br>[= 5000 – {(8000*5%)*7/7}] |

**Table 35 Proportionate Assignment under Cash Flow Based Assumptions, %**

c. Assumption Unit = Value

$$Cash\ Flow_{Proportionate,\$} = Assumption\ Value \times \frac{t}{T}$$

| Business Assumption | | | Cash Flow Assignment | | |
|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Revised Cash Flow** |
| Time Deposits | 8-15 Days | 3000 | 10000 | Overnight | 10000 [= 10000 – (3000*0/7)] |
| | | | 5000 | 1-7 Days | 2000 [= 5000 – (3000*7/7)] |

**Table 36 Proportionate Assignment, Value**

**4. Decreasing Assignment**

Cash flows are assigned to each bucket up to the selected bucket in decreasing order based on ranks assigned to cash flows. Assignments are made in decreasing order to selected level and further assignment is done till the most granular level. The formulae under different conditions are as follows:

a. EOP Balance Based Assumptions, Assumption Unit = Percentage

$$Cash\ Flow_{Decreasing,Balance\ Based,\%} = (EOP\ Balance \times Assumption\ \%) \times \left(\frac{Bucket\ Rank}{\sum Bucket\ Rank}\right)$$

Where,

Bucket Rank: This is the rank assigned to each Level X bucket within the bucket set. The rank is assigned in decreasing order that is, 1 is assigned to the last bucket in the set, 2 is assigned to the previous bucket and so on.

| Business Assumption | | | Cash Flow Assignment | | | |
|---|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Bucket Rank** | **Revised Cash Flow** |
| Time Deposits | 1-3 Months | 5% | 10000 | Overnight | 4 | 0<br>[= 10000 – (500000*5%)*4/10] |
| | | | 5000 | 1-7 Days | 3 | – 2500<br>[= 5000 – (500000*5%)*3/10] |
| | | | 8000 | 8-15 Days | 2 | 3000<br>[= 8000 – (500000*5%)*2/10] |
| | | | 3000 | 16-30 Days | 1 | 500<br>[= 3000 – (500000*5%)*1/10] |

**Table 37 Decreasing Assignment under Balance Based Assumptions, %**

b. Cash Flow Based Assumptions, Assumption Unit = Percentage

$$\boldsymbol{Cash\ Flow}_{\boldsymbol{Decreasing,CF\ Based,\%}} = (\boldsymbol{Cash\ Flow}_{\boldsymbol{n}} \times \boldsymbol{Assumption}\ \%) \times \left(\frac{\boldsymbol{Bucket\ Rank}}{\sum \boldsymbol{Bucket\ Rank}}\right)$$

| Business Assumption | | | Cash Flow Assignment | | | |
|---|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Bucket Rank** | **Revised Cash Flow** |
| Time Deposits | 1-3 Months | 5% | 10000 | Overnight | 4 | 9880<br>[= 10000 – (6000*5%)*4/10] |
| | | | 5000 | 1-7 Days | 3 | 4910 |

| Business Assumption | | | Cash Flow Assignment | | | |
|---|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Bucket Rank** | **Revised Cash Flow** |
| | | | | | | [= 5000 – (6000*5%)*3/10] |
| | | | 8000 | 8-15 Days | 2 | 7940<br>[= 8000 – (6000*5%)*2/10] |
| | | | 3000 | 16-30 Days | 1 | 2970<br>[= 3000 – (6000*5%)*1/10] |

**Table 38 Decreasing Assignment under Cash Flow Based Assumptions, %**

c. Assumption Unit = Value

$$Cash\ Flow_{Decreasing,\$} = Assumption\ Value \times \left(\frac{Bucket\ Rank}{\sum Bucket\ Rank}\right)$$

| Business Assumption | | | Cash Flow Assignment | | | |
|---|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Bucket Rank** | **Revised Cash Flow** |
| Time Deposits | 1-3 Months | 3000 | 10000 | Overnight | 4 | 8800<br>[= 10000 – (3000*4/10)] |
| | | | 5000 | 1-7 Days | 3 | 4100<br>[= 5000 – (3000*3/10)] |
| | | | 8000 | 8-15 Days | 2 | 7400<br>[= 8000 – (3000*2/10)] |

| Business Assumption | | | Cash Flow Assignment | | | |
|---|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Bucket Rank** | **Revised Cash Flow** |
| | | | 3000 | 16-30 Days | 1 | 2700<br>[= 3000 – (3000*1/10)] |

**Table 39 Decreasing Assignment, Value**

**5. Increasing Assignment**

Cash flows are assigned to each bucket up to the selected bucket in increasing order based on ranks assigned to cash flows. Assignments are made in increasing order to the selected level and further assignment is done till the most granular level. The formulae under different conditions are as follows:

a. EOP Balance Based Assumptions, Assumption Unit = Percentage

$$\boldsymbol{Cash\ Flow}_{\boldsymbol{Increasing,Balance\ Based},\%} = (\boldsymbol{EOP\ Balance} \times \boldsymbol{Assumption}\ \%) \times \left(\frac{\boldsymbol{Bucket\ Rank}}{\sum \boldsymbol{Bucket\ Rank}}\right)$$

Where,

Bucket Rank: Rank assigned to each Level 0 bucket within the bucket set. The rank is assigned in increasing order i.e. 1 is assigned to the first bucket in the set, 2 is assigned to the next bucket and so on.

| Business Assumption | | | Cash Flow Assignment | | | |
|---|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Bucket Rank** | **Revised Cash Flow** |
| Time Deposits | 8-15 Days | 5% | 10000 | Overnight | 1 | 1666.67<br>[= 10000 – (500000*5%)*1/3] |
| | | | 5000 | 1-7 Days | 2 | – 11666.67 |

| Business Assumption | | | Cash Flow Assignment | | | |
|---|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Bucket Rank** | **Revised Cash Flow** |
| | | | | | | [= 5000 – (500000*5%)*2/3] |

**Table 40 Increasing Assignment under Balance Based Assumptions, %**

b. Cash Flow Based Assumptions, Assumption Unit = Percentage

$$\boldsymbol{Cash\ Flow}_{\boldsymbol{Increasing,CF\ Based},\%} = (\boldsymbol{Cash\ Flow}_{\boldsymbol{n}} \times \boldsymbol{Assumption}\ \%) \times \left(\frac{\boldsymbol{Bucket\ Rank}}{\sum \boldsymbol{Bucket\ Rank}}\right)$$

| Business Assumption | | | Cash Flow Assignment | | | |
|---|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Bucket Rank** | **Revised Cash Flow** |
| Time Deposits | 8-15 Days | 5% | 10000 | Overnight | 1 | 9866.67<br>[= 10000 – (8000*5%)*1/3] |
| | | | 5000 | 1-7 Days | 2 | 4733.33<br>[= 5000 – (8000*5%)*2/3] |

**Table 41 Increasing Assignment under Cash Flow Based Assumptions, %**

c. Assumption Unit = Value

$$Cash\ Flow_{Increasing,\$} = Assumption\ Value \times \left(\frac{Bucket\ Rank}{\sum Bucket\ Rank}\right)$$

| Business Assumption | | | Cash Flow Assignment | | | |
|---|---|---|---|---|---|---|
| **Product** | **Time Bucket** | **Run-off** | **Contractual Cash Flow** | **Time Bucket** | **Bucket Rank** | **Revised Cash Flow** |
| Time Deposits | 8-15 Days | 3000 | 10000 | Overnight | 1 | 9000<br>[= 10000 – (3000*1/3)] |
| | | | 5000 | 1-7 Days | 2 | 3000<br>[= 5000 – (3000*2/3)] |

**Table 42 Increasing Assignment, Value**

**NOTE:** If assumptions are specified on bucket levels other than Level 0, the assignment is done at the selected level and further assignment is done at the higher granular levels, using the same cash flow assignment methodology selected, till assignment has been made to Level 0 buckets. The only exception is the selected time bucket method where the cash flow is assigned proportionately to higher granular bucket levels based on the bucket size. Previously, the assignment to more granular levels was done equally.

An illustration of assignment across multiple levels is provided in the following table. Suppose $1000 is assigned in increasing order to buckets at multiple levels. The assignment is done as follows:

| Level 2 Bucket | Rank | Amount Assigned | Level 1 Bucket | Rank | Amount Assigned | Level 0 Bucket | Rank | Amount Assigned |
|---|---|---|---|---|---|---|---|---|
| 1 – 3 Week | 1 | 333.33<br>[= (1000*1/3)] | 1 Week | 1 | 111.11<br>[= (333.33*1/3)] | 1 Week | 1 | 111.11<br>[= (111.11*1/1)] |
| | | | 2 – 3 | 2 | 222.22 | 2 Week | 1 | 74.07 |

| Level 2 Bucket | Rank | Amount Assigned | Level 1 Bucket | Rank | Amount Assigned | Level 0 Bucket | Rank | Amount Assigned |
|---|---|---|---|---|---|---|---|---|
| | | | Week | | [= (333.33*2/3)] | | | [= (222.22*1/3)] |
| | | | | | | 3 Week | 2 | 148.15<br>[= (222.22*2/3)] |
| 4 – 8 Week | 2 | 666.67<br>[= (1000*2/3)] | 4 – 5 Week | 1 | 222.22<br>[= (666.67*1/3)] | 4 Week | 1 | 74.07<br>[= (222.22*1/3)] |
| | | | | | | 5 Week | 2 | 148.15<br>[= (222.22*2/3)] |
| | | | 6 – 8 Week | 2 | 444.44<br>[= (666.67*1/3)] | 6 Week | 1 | 74.07<br>[= (444.44*1/6)] |
| | | | | | | 7 Week | 2 | 148.15<br>[= (444.44*2/6)] |
| | | | | | | 8 Week | 3 | 222.22<br>[= (444.44*3/6)] |

**Table 43 Cash Flow Assignment to Multiple Bucket Levels**

### 6. New Business

End of Period (EOP) Asset Balance of Growth assumption allows you to select the method for cash flow assignment. Various options for cash flow assignment available are as follows:

Decreasing – In decreasing order to all time buckets up to and including the selected time bucket.

Equal – Equally to all time buckets up to and including the selected time bucket.

Proportional – In proportion to the time bucket size.

Selected – Selected time bucket only.

**Decreasing** Cash flow assignment is done using the following formula:

$$\boldsymbol{Cash\ Flow_{for\ Bucket\ n} = EOP\ amount * Percentage\ Specified * (1 - Percentage\ Specified)^{(n-1)}}$$

$$\boldsymbol{where\ n = number\ of\ time\ buckets}$$

**Equal** cash flow assignment is done using the following formula:

$$\boldsymbol{Cash\ Flow_{for\ Bucket\ n} = \frac{(EOP\ amount * Percentage\ Specified)\ OR\ (Amount\ Specified)}{Total\ number\ of\ Time\ Buckets}}$$

**Proportional** Cash flow assignment is done using the following formula:

$$\boldsymbol{Cash\ Flow_{for\ Bucket\ n} = (EOP\ amount * Percentage\ Specified)\ OR\ (Amount\ Specified) * \frac{Number\ of\ days\ in\ Time\ bucket\ n}{Total\ number\ of\ days\ in\ all\ the\ considered\ Time\ buckets}}$$

**Selected** Cash flow assignment is done using the following formula:

$$\boldsymbol{Cash\ Flow_{for\ Bucket\ n} = (EOP\ amount * Percentage\ Specified)\ OR\ (Amount\ Specified)}$$

EOP Liability Balance Growth assumption allows you to select the method for cash flow assignment. Various options for cash flow assignment available are as follows:

- Decreasing – In decreasing order to all time buckets up to and including the selected time bucket.
- Equal – Equally to all time buckets up to and including the selected time bucket.

- Proportional – In proportion to the time bucket size.
- Selected – Selected time bucket only.

**Decreasing** Cash flow assignment is done using the following formula:

$$Cash\ Flow_{for\ Bucket\ n} = EOP\ amount * Percentage\ Specified * (1 - Percentage\ Specified)^{(n-1)}$$

$$where\ n = number\ of\ time\ bucket$$

**Equal** Cash flow assignment is done using the following formula:

$$Cash\ Flow_{for\ Bucket\ n} = \frac{(EOP\ amount * Percentage\ Specified)\ OR\ (Amount\ Specified)}{Total\ number\ of\ time\ buckets}$$

**Proportional** Cash flow assignment is done using the following formula:

$$Cash\ Flow_{for\ Bucket\ n} = (EOP\ amount * Percentage\ Specified)\ OR\ (Amount\ Specified) * \frac{Number\ of\ days\ in\ Time\ bucket\ n}{Total\ number\ of\ days\ in\ all\ the\ considered\ Time\ buckets}$$

**Selected** Cash flow assignment is done using the following formula:

$$Cash\ Flow_{for\ Bucket\ n} = (EOP\ amount * Percentage\ Specified)\ OR\ (Amount\ Specified)$$

**7. Drawdown**

Funding Line of Credit allows you to select the method for cash flow assignment. This business assumption also allows you to select the method for cash flow assignment. Various options for cash flow assignment available are as follows:

- Decreasing – In decreasing order to all time buckets up to and including the selected time bucket.
- Equal – Equally to all time buckets up to and including the selected time bucket.
- Proportional – In proportion to the time bucket size.
- Selected – Selected time bucket only.

**Decreasing** Cash flow assignment is done using the following formula:

$$\boldsymbol{Cash\ Flow_{for\ Bucket\ n} = Undrawn\ amount * Percentage\ Specified * (1 - Percentage\ Specified)^{(n-1)}}$$

$$\boldsymbol{where\ n = number\ of\ time\ bucket}$$

**Equal** Cash flow assignment is done using the following formula:

$$\boldsymbol{Cash\ Flow_{for\ Bucket\ n} = \frac{(Undrawn\ amount * Percentage\ Specified)\ OR\ (Amount\ Specified)}{Total\ number\ of\ Time\ Buckets}}$$

**Proportional** Cash flow assignment is done using the following formula:

$$\boldsymbol{Cash\ Flow_{for\ Bucket\ n} = (Undrawn\ amount * Percentage\ Specified)\ OR\ (Amount\ Specified) * \frac{Number\ of\ days\ in\ Time\ bucket\ n}{Total\ number\ of\ days\ in\ all\ the\ considered\ Time\ buckets}}$$

**Selected** Cash flow assignment is done using the following formula:

$$\boldsymbol{Cash\ Flow_{for\ Bucket\ n} = (Undrawn\ amount * Percentage\ Specified)\ OR\ (Amount\ Specified)}$$

Credit Line Draw down allows you to select the method for cash flow assignment. This assumption also allows you to specify the corresponding cash outflow for the specified cash inflow.

Various options for cash flows assignment available for this assumption are as follows:

- Decreasing – In decreasing order to all time buckets up to and including the selected time bucket.
- Equal – Equally to all time buckets up to and including the selected time bucket
- Proportional – In proportion to the time bucket size
- Selected – Selected time bucket only.

**Decreasing** Cash flow assignment is done using the following formula:

$$\boldsymbol{Cash\ Flow_{for\ Bucket\ n} = Undrawn\ amount * Percentage\ Specified * (1 - Percentage\ Specified)^{(n-1)}}$$

$$\boldsymbol{where\ n = number\ of\ time\ bucket}$$

**Equal** Cash flow assignment is done using following formula:

$$\boldsymbol{Cash\ Flow_{for\ Bucket\ n} = \frac{(Undrawn\ amount * Percentage\ Specified)\ OR\ (Amount\ Specified)}{Total\ number\ of\ Time\ Buckets}}$$

**Proportional** Cash flow assignment is done using the following formula:

$$\boldsymbol{Cash\ Flow_{for\ Bucket\ n} = (Undrawn\ amount * Percentage\ Specified)\ OR\ (Amount\ Specified) * \frac{Number\ of\ days\ in\ Time\ bucket\ n}{Total\ number\ of\ days\ in\ all\ the\ considered\ Time\ buckets}}$$

**Selected** Cash flow assignment is done using the following formula:

$$Cash\ Flow_{for\ Bucket\ n} = (Undrawn\ amount * Percentage\ Specified)\ OR\ (Amount\ Specified$$

### 6.5.1 Assumption Calculation

In the Run Definition window, assumptions can either be "Applied To" Changing Balance/Cash Flows or Original Balance/Cash Flows. This calculation is applied across business assumptions in a single Run. It is applicable across business assumptions based on the option selected as part of the Assumption Applied To field in the Run Definition window. This means that all assumptions are now executed sequentially and the effects of the previous assumption are taken into account if the Changing Balance/Cash Flows option is selected in the Run Definition window.

1. **Original Balance/ Cash Flows**:

When the user selects Original Balance/Cash Flows as a Run level parameter, it calculates the assumption based on the original balance. It has a standalone effect i.e. assumption value is always applied on the original balance. This basis is applicable to each subsequent business assumption where the effects of the previous assumption are ignored for the purpose of estimating the impact of an assumption i.e. the assumption cash flows arising out of the given assumption.

Example 1: In case of original balance, when a Run is executed with two assumptions, the assumption value is defined on the original balance and not on the revised balance of the selected bucket (Refer table 2 – Customer 2)

*Run 1: Original Balance (Run-off and Rollover)*

Assumption 1: Run-off

| **Business Assumption Definition** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Legal Entity** | **Customer** | **From Bucket** | **To Bucket** | **Assumption Unit** | **Run-off** | **Assignment Method** | **Assumption Category** | **Based On** |
| Legal Entity 1 | Customer 2 | 6-6Days | 3-3Days | Percentage | 10% | Equal | Cash Flow Movement : Run - off | Cash Flows |

| Computation | | | | | |
|---|---|---|---|---|---|
| **To Bucket** | **Contractual Cash Flow (From Bucket)** | **Contractual Cash Flow (To Bucket)** | **Run-off** | **Revised Cash flow - From Bucket** | **Revised Cash flow -To Bucket** |
| Overnight | 20000 | 10000 | 500 (20000*10%)/4 | 18000 (20000-2000) | 10500 (10000+500) |
| 1-1 Day | | 11000 | 500 (20000*10%)/4 | | 11500 (11000+500) |
| 2-2 Days | | 22000 | 500 (20000*10%)/4 | | 22500 (22000+500) |
| 3-3 Days | | 12000 | 500 (20000*10%)/4 | | 12500 (12000+500) |

**Table 44 Assumption Calculation - Original Balance/ Cash Flows(Run-off)**

Assumption 2: Rollover

| Business Assumption Definition | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Legal Entity** | **Customer** | **From Bucket** | **To Bucket** | **Assumption Unit** | **Rollover** | **Assignment Method** | **Assumption Category** | **Based On** |
| Legal Entity 1 | Customer 1 | 6-6Days | 7-7 Days | Percentage | 10% | Selected | Cash Flow Movement : Rollover | Cash Flows |
| | Customer 2 | | 8-8 Days | | 20% | | | |

| Computation | | | | | |
|---|---|---|---|---|---|
| To Bucket | Contractual Cash Flow (From Bucket) | Contractual Cash Flow (To Bucket) | Rollover | Revised Cash flow - From Bucket | Revised Cash flow -To Bucket |
| 7-7 Days | 20000 | 7000 | 2000 (20000*10%) | 14000 (20000-2000-4000) | 9000 (7000+2000) |
| 8-8 Days | | 10500 | 4000 (20000*20%) | | 14500 (10500+4000) |

**Table 45 Assumption Calculation - Original Balance/ Cash Flows (Rollover)**

2. **Changing Balance/Cash Flows**:

   This takes into account the cascading effect of an assumption on cash flows and EOP balance at a Run level parameter. Cascading effect refers to the scenario where the impact of the assumption value is calculated based on changing balance across assumptions and “not within an assumption”. However, cascading effect can be seen across assumptions at Run level taking into consideration the impact of the previous assumption on the EOP balance or cash flows. In this case, the cash flows or EOP balances are recalculated after each assumption and the subsequent assumption values are calculated based on the updated cash flows or balances.

Example 1: In case of changing balance, when a Run is executed with two assumptions, the assumption value is defined on the revised balance of the selected buckets.

Run 2: Changing Balance (Run-off and Cash Flow Delay)

Assumption 1: Run-off

| **Business Assumption Definition** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Legal Entity** | **Customer** | **From Bucket** | **To Bucket** | **Assumption Unit** | **Applied to** | **Run-off** | **Assignment Method** | **Assumption Category** | **Based On** |
| Legal Entity 2 | Customer 3 | 6-6 Days | 3-3 Days | Percentage | Changing Balance | 10% | Equal | Cash Flow Movement : Run - off | Cash Flows |

| **Computation** | | | | | |
|---|---|---|---|---|---|
| **To Bucket** | **Contractual Cash Flow (From Bucket)** | **Contractual Cash Flow (To Bucket)** | **Run-off** | **Revised Cash flow - From Bucket** | **Revised Cash flow -To Bucket** |
| Overnight | 20000 | 10000 | 500 (20000*10%)/4 | 18000 (20000- 2000) | 10500 (10000+500) |
| 1-1Days | | 11000 | 500 (20000*10%)/4 | | 11500 (11000+500) |
| 2-2Days | | 22000 | 500 (20000*10%)/4 | | 22500 (22000+500) |
| 3-3Days | | 12000 | 500 (20000*10%)/4 | | 12500 (12000+500) |

**Table 46 Assumption Calculation - Changing Balance/Cash Flows (Run-off)**

Assumption 2: Cash Flow Delay

| **Business Assumption Definition** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Customer** | **From Bucket** | **To Bucket** | **Assumption Unit** | **Applied to** | **Assignment Method** | **Assumption Category** | **Based On** |
| Customer 3 | 6-6 Days | 12-12 Days | Percentage | Changing Balance | Selected | Cash Flow Movement : Cash Flow Delay | Cash Flows |

| **Computation** | | | | |
|---|---|---|---|---|
| **Contractual Cash Flow (From Bucket)** | **Contractual Cash Flow (To Bucket)** | **Delay + Penalty** | **Revised Cash flow - From Bucket** | **Revised Cash flow -To Bucket** |
| 18000 | 23000 | 10% + 5% | 16200 (18000-10%*18000) | 24890 {23000+ (18000*10%) + (1800*5%)} |

**Table 47 Assumption Calculation- Cash Flow Delay**

In the above computation, when Run is executed with a new assumption category, assumption value is applied on the changing balance.

## 6.6 Business Assumption Definition

The Business Assumption Definition window has the following sections for the purpose of defining assumption parameters:

- Linked To
- Assumption Details
- Assumption Properties
- Dimension Selection
- Time Bucket Definition Selection
- Assumption Parameter Specification

### 6.6.1 Linked To

The details must be specified as follows:

- **Folder**: Select the **Folder** which is specific to the business assumption definition.
- **Access Type**: Choose the access type option, Read/Write or Read Only.

### 6.6.2 Assumption Details

The details for each business assumptions are entered here as follows:

- **Assumption Name**: Specify the Assumption Name.
- **Assumption Description**: Enter the assumption description.
- **Intraday Assumption**: Select Yes or No if it is an intraday assumption.

### 6.6.3 Assumption Properties

Assumption properties are the basic parameters required for defining a business assumption. They include:

- Assumption Category
- Assumption Sub-Category
- Based On
- Assumption Legs
- Assignment Method – Leg 1
- Assignment Method – Leg 2
- Assumption Unit
- Assumption Currency
- Ratings Downgrade

- Transaction Legs
- Charge Penalty
- Specify Collateral/Underlying
- Sale Specification By

#### 6.6.3.1 Assumption Category

The application supports multiple types of business assumptions, each of which are classified into 4 broad categories based on the behavior exhibited by the individual business assumptions. These categories are selected from a drop down list as follows:

- Cash Flow Movement
- Encumbrance
- Incremental Cash Flow
- Value Change

The other assumption properties required to be specified by a user as part of this section will depend on the selection of the assumption category.

#### 6.6.3.2 Assumption Sub-category

The application supports multiple types of business assumptions, each of which are classified into sub-categories based on the behavior exhibited by the individual business assumptions. These sub-categories are selected from a drop down list as follows:

a. Cash Flow Movement
   - Asset Sale
   - Cash Flow Delay
   - Cash Flow Movement
   - Delinquency
   - Prepayment
   - Recovery
   - Rollover
   - Run-off

b. Incremental Cash Flow
   - Drawdown
   - Incremental Cash Flow
   - Liability Run-Off
   - New Business
   - Ratings Downgrade

- Run-off
- Secured Funding/Financing
- Valuation Changes

c. Encumbrance
- Encumbrance
- Ratings Downgrade
- Valuation Changes

d. Value Change
- Available Stable Funding Factor
- Haircut
- Required Stable Funding Factor

#### 6.6.3.3 Assumption Intraday Sub-category

The application supports multiple types of business assumptions, each of which are classified into sub-categories based on the behavior exhibited by the individual business assumptions.

When Intraday Assumption is selected Yes in the Business Assumption Definition window the following sub-categories are available for selection from the drop down list:

a. Cash Flow Movement
- Time Shift in Payments
- Payments Default

b. Encumbrance
- Withdrawal of Credit Lines

c. Incremental Cash Flow
- Intraday Drawdown
- Large Unexpected Payments

d. Value Change
- Intraday Valuation Changes

#### 6.6.3.4 Based On

This option determines the measure that the assumption values are applied to in order to obtain cash flows. From the drop-down list, you are allowed to select the option on which different assumption values are applied.

The table below helps to understand the set of parameters for each assumption category and sub-category.

| Assumption Category | Assumption Sub-Category | Based On |
|---|---|---|
| Cash Flow Movement | Cash Flow Movement | Cash Flows<br>EOP Balance<br>Fair Value<br>Fair Value of Collateral Posted<br>Fair Value of Collateral Received<br>High Run-off Category 1 Balance<br>High Run-off Category 2 Balance<br>High Run-off Category 3 Balance<br>Highly Stable Balance<br>Insured Balance<br>Less Stable Balance<br>Market Value<br>Market Value of Collateral Posted<br>Market Value of Collateral Received<br>Stable Balance<br>Uninsured Balance |
| | Run-Off | Cash Flows<br>EOP Balance<br>High Run-off Category 1 Balance<br>High Run-off Category 2 Balance<br>High Run-off Category 3 Balance<br>Highly Stable Balance<br>Insured Balance<br>Less Stable Balance<br>Stable Balance<br>Uninsured Balance |
| | Prepayment | Cash Flows |
| | Cash Flow Delay | Cash Flows |
| | Delinquency | Cash Flows |
| | Recovery | Cash Flows |

| Assumption Category | Assumption Sub-Category | Based On |
|---|---|---|
| | Rollover | Cash Flows<br>Fair Value of Collateral Posted<br>Fair Value of Collateral Received<br>Market Value of Collateral Posted<br>Market Value of Collateral Received |
| | Asset Sale | EOP Balance<br>Fair Value<br>Market Value |
| Encumbrance | Encumbrance | Downgrade Impact Value<br>Fair Value<br>Fair Value of Collateral Posted<br>Fair Value of Collateral Received<br>Fair Value of Excess Collateral<br>Fair Value of Required Collateral<br>Largest 30 Day Cumulative Collateral Amount<br>Market Value<br>Market Value of Collateral Posted<br>Market Value of Collateral Received<br>Market Value of Excess Collateral<br>Market Value of Required Collateral |
| | Ratings Downgrade | Downgrade Impact Value |
| | Valuation Changes | Fair Value<br>Fair Value of Collateral Posted<br>Fair Value of Collateral Received<br>Fair Value of Excess Collateral<br>Fair Value of Required Collateral<br>Largest 30 Day Cumulative Collateral Amount<br>Market Value<br>Market Value of Collateral Posted<br>Market Value of Collateral Received |

| Assumption Category | Assumption Sub-Category | Based On |
|---|---|---|
| | | Market Value of Excess Collateral<br>Market Value of Required Collateral |
| Incremental Cash Flow | Incremental Cash Flow | Available Undrawn Amount<br>Cash Flows<br>Downgrade Impact Value<br>EOP Balance<br>Fair Value<br>Fair Value of Collateral Posted<br>Fair Value of Collateral Received<br>Fair Value of Excess Collateral<br>Fair Value of Required Collateral<br>General Ledger Balance<br>High Run-off Category 1 Balance<br>High Run-off Category 2 Balance<br>High Run-off Category 3 Balance<br>Highly Stable Balance<br>Insured Balance<br>Largest 30 Day Cumulative Collateral Amount<br>Less Stable Balance<br>Market Value<br>Market Value of Collateral Posted<br>Market Value of Collateral Received<br>Market Value of Excess Collateral<br>Market Value of Required Collateral<br>Non-Contractual Obligation Amount<br>Non Operational Balance<br>Penalty Free Portion of Stable Balance<br>Penalty Free Portion of Highly Stable Balance<br>Stable Balance<br>Undrawn Balance<br>Uninsured Balance |
| | Run-Off | Available Undrawn Amount |

| Assumption Category | Assumption Sub-Category | Based On |
|---|---|---|
| | | EOP Balance |
| | | EOP amount with significant penalty or withdrawal |
| | | Encumbered Balance |
| | | Fair Value of Collateral Posted |
| | | Fair Value of Collateral Received |
| | | General Ledger Balance |
| | | High Run-off Category 1 Balance |
| | | High Run-off Category 2 Balance |
| | | High Run-off Category 3 Balance |
| | | Highly Stable Balance |
| | | Insured Amount Withdrawal without penalty |
| | | Insured Balance |
| | | Less Stable Balance |
| | | Less Stable Balance withdrawable amount without penalty |
| | | Market Value |
| | | Market Value of Collateral Posted |
| | | Market Value of Collateral Received |
| | | Minimum Amount Due |
| | | Net Derivative Cash Inflow net of collateral |
| | | Non Contractual Obligation Amount |
| | | Non Operational Balance |
| | | Operational Balance |
| | | Penalty Free Portion of High Run-off Category 1 Amount |
| | | Penalty Free Portion of High Run-off Category 2 Amount |
| | | Penalty Free Portion of High Run-off Category 3 Amount |
| | | Penalty Free Portion of Stable Balance |
| | | Returnable Asset Value |
| | | Secured Lending inflow Amount |
| | | Segregated Inflow Amount |
| | | Stable Balance |
| | | Structured Outflow Amount |
| | | Unencumbered Balance |

| Assumption Category | Assumption Sub-Category | Based On |
|---|---|---|
| | | Unencumbered Stable Amount<br>Unencumbered Less Stable Amount<br>Uninsured Amount Withdrawal without penalty<br>Uninsured Balance<br>Uninsured Non Operational Amount<br>Uninsured Operational Amount<br>Uninsured Operational Amount<br>Unsecured Lending Dues |
| | Drawdown | Adjusted Undrawn Amount<br>Available Undrawn Amount<br>Portion of the undrawn amount that can be drawn in liquidity horizon period<br>Structured Outflow Amount<br>Undrawn Balance |
| | Liability Run-Off | Balance |
| | New Business | EOP Balance |
| | Ratings Downgrade | Downgrade Impact Value<br>Underlying Mitigant Value |
| | Secured Funding / Financing | Cash Flows<br>EOP Balance |
| | Valuation Changes | Additional Collateral Amount For Derivatives<br>Collateral Valuation Change Amount<br>Contractually Due Collateral<br>Dividend Payable<br>Excess Collateral Due<br>Excess Contractual Obligation Amount<br>Fair Value<br>Fair Value of Collateral Posted<br>Fair Value of Collateral Received |

| Assumption Category | Assumption Sub-Category | Based On |
|---|---|---|
| | | Fair Value of Excess Collateral<br>Fair Value of Required Collateral<br>Largest 30 Day Cumulative Collateral Amount<br>Market Value<br>Market Value of Collateral Posted<br>Market Value of Collateral Received<br>Market Value of Excess Collateral<br>Market Value of Required Collateral<br>Net Derivative Cash Outflow net of collateral |
| Value Change | Available Stable Funding Factor | Cash Flows<br>EOP Balance<br>Less Stable Balance<br>NSFR Derivative Liabilities<br>Net NSFR Derivative Liabilities<br>Non-Operational Balance<br>Non-Operational Cash Flows<br>Operational Balance<br>Operational Cash Flows<br>Stable Balance<br>Standard Accounting Head Balance<br>Total Less Stable Balance<br>Total Less Stable Cash Flows<br>Total Stable Balance<br>Total Stable Cash Flows |
| | Haircut | Fair Value<br>Market Value |
| | Required Stable Funding Factor | Additional Derivative Liability for RSF<br>Cash Flows<br>Derivative Liability Amount<br>EOP Balance<br>Encumbered Balance |

| Assumption Category | Assumption Sub-Category | Based On |
|---|---|---|
| | | Fair Value<br>Fair Value or Collateral Posted<br>GL Balance<br>Initial Margin Posted<br>Market Value<br>Market Value of Collateral Posted<br>NSFR Derivative Assets<br>Net NSFR Derivative Assets<br>Non Contractual Obligation Amount<br>Non-Operational Balance<br>Operational Balance<br>Undrawn Amount<br>Unencumbered Balance |

When the **Intraday Assumption** is selected as **Yes** in the **Business Assumption Definition** window the following set of parameters for each assumption category and sub-category:

| Assumption Category | Assumption Sub-Category | Based On |
|---|---|---|
| Cash Flow Movement | Time Shift in Payments | Payments Received<br>Payments Made |
| | Payments Default | Payments Received |
| Encumbrance | Withdrawal of Credit Lines | Undrawn Amount |
| Incremental Cash Flow | Intraday Drawdown | Undrawn Amount |
| | Large Unexpected Payments | Payments Made<br>Payments Received |
| Value Change | Intraday Valuation Changes | Available Intraday liquidity |

**Table 48 Based On**

#### 6.6.3.5 Assumption Legs

This option determines if only the off-set leg or both the primary and the off-set legs are required for the purpose of specifying the business assumption value as part of the assumption specification section. This is based on the type of business assumption being specified. For instance, in case of rollover, prepayments, Run-offs etc. assumption values are applied only to the off-set leg as the primary leg of the transaction has already occurred in the past. However, in case of a new business assumption, such as deposit growth, both the primary leg (amount deposited) and the off-set leg (repayment of amount deposited) are required as both legs occur in the future. This selection is determined by the assumption sub category selected. In the case of sub categories where only one option is applicable, the selection has been defaulted to One in an un-editable mode. In cases where both values are applicable, Two can be selected.

The following options are present:

- **One**: In case, One is selected as assumption leg, then only column appears for entering the off-set assumption value.
- **Two**: In case, Two is selected as the assumption leg, then two columns appear for entering primary assumption value and secondary or off-set value.

#### 6.6.3.6 Assignment Method – Leg 1

This option determines how the primary assumption value is allocated to time buckets. There are specific methods in which the assumption value can be distributed across buckets. Assignment methods determine the manner in which the primary assumption values are assigned to multiple buckets in order to determine the cash flows. Leg 1 is applicable when only one leg of the transaction is affected i.e. when the assumption legs field value is selected as One.

The options are as follows:

- Selected Time Bucket
- Increasing
- Decreasing
- Equal
- Proportionate

1. **Selected Time Bucket**

   This method assigns the cash flows only to the time buckets against which the assumption value is specified. If the assumption is not specified on Level 0 buckets, then the assignment to the more granular buckets is done proportionately to the bucket size.

   The formula is as follows:

$$\boldsymbol{Cash\ Flow}_{\boldsymbol{Selected\ ,Cash\ Flow\ Based},\%} = (\boldsymbol{Cash\ Flow} \times \boldsymbol{Assumption}\ \%\ )\boldsymbol{or\ Amount}$$

The time buckets used for computation are as follows:

| N_BUCKET_NO | V_BUCKET_NAME | V_BUCKET_NAME_CATEGORY |
|---|---|---|
| 1 | Overnight | Overnight |
| 2 | 1-10Days | 1-15Days |
| 3 | 11-15Days | 1-15Days |
| 4 | 16-20Days | 16-30Days |
| 5 | 21-25Days | 16-30Days |
| 6 | 26-30Days | 16-30Days |

The example below illustrates allocation of cash flows when the assumption value is specified for a Level 0 bucket.

| Assumption Category | Assumption Unit | Applied to | Assignment Method | Based On |
|---|---|---|---|---|
| Cash Flow Movement- Run-off | Percentage | Original Balance | Selected | Cash Flow |

| Business Assumption | | | | | Computation | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Product** | **Customer** | **From Bucket** | **To Bucket** | **Run-off %** | **Contractual Cash Flow (From Bucket)** | **Contractual Cash Flow (To Bucket)** | **Run-off** | **Revised Cash flow - From Bucket** | **Revised Cash flow -To Bucket** |
| Time Deposits | Customer 1 | 10-10Days | 5-5Days | 10% | 30000 | 23000 | 3000 (30000* 10%) | 33000 (30000+ 3000) | 20000 (23000--3000) |

**Table 49 Assignment Method Leg 1 - Selected Time Bucket Example 1**

However, this allocation differs for Levels other than Level 0 buckets as Illustrated in the following example.

The example below illustrates, the selected Cash Flow assignment method on Level 1 buckets.

| **Business Assumption** | | | | **Computation** | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Customer** | **From Bucket** | **To Bucket** | **Run-off %** | **Contractual Cash Flow (From Bucket)** | **To Bucket** | **Contractual Cash Flow (To Bucket)** | **Run-off** | **Revised Cash flow - From Bucket** | **Revised Cash flow -To Bucket** |
| Customer 1 | 16-30Days | 1-15Days | 10% | 50000 | 1-10Days | 21000 | 5000 (50000*10%) | 45000 (50000-5000) | 24333.33 {21000+(5000*10/15)} |
| | | | | | 11-15Days | 15000 | | | 16666.67 {15000+(5000*5/15)} |

**Table 50 Assignment Method Leg 1 - Selected Time Bucket Example 2**

**2. Increasing assignment:**

The cash flows are assigned to each bucket up to the selected bucket in increasing order based on ranks assigned to cash flows. Assignments are made in increasing order to the selected level and further assignment is done until the most granular level.

The formulae under different conditions are as follows**:**

**1. When, Cash Flow Based Assumptions, Assumption Unit = Percentage**

$$Cash\ Flow_{Increasing,CF\ Based,\%} = (Cash\ Flow_n \times Assumption\ \%) \times \left(\frac{Bucket\ Rank}{\sum Bucket\ Rank}\right)$$

**2. When, Assumption Unit = Value**

$$Cash\ Flow_{Increasing,\$} = Assumption\ Value \times \left(\frac{Bucket\ Rank}{\sum Bucket\ Rank}\right)$$

The example below illustrates, Increasing Cash Flow assignment method based on Cash Flow.

| Assumption Category | Assumption Unit | Applied to | Assignment Method | Based On |
|---|---|---|---|---|
| Cash Flow Movement- Run-off | Percentage | Original Balance | Increasing | Cash Flow |

| Business Assumption | | | | | | Computation | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Product** | **Customer** | **From Bucket** | **To Bucket** | **Run-off %** | **To Bucket** | **Bucket Rank** | **Contractual Cash Flow (From Bucket)** | **Contractual Cash Flow (To Bucket)** | **Run-off (Value)** | **Revised Cash flow - From Bucket** | **Revised Cash flow -To Bucket** |
| Assets | Customer 1 | 10-10Days | 3-3Days | 10% | Overnight | 1 | 30000 | 20000 | 300 =(30000*10%)*1/10 | 27000 =(30000-3000) | 20300 = (20000+300) |
| | | | | | 1-1Days | 2 | | 21000 | 600 =(30000*10%)*2/10 | | 21600 == (21000+600) |
| | | | | | 2-2Days | 3 | | 19000 | 900 =(30000*10%)*3/10 | | 19900 = (19000+900) |
| | | | | | 3-3Days | 4 | | 27000 | 1200 =(30000*1 | | 28200 = |

| Business Assumption | | | | | | Computation | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Product | Customer | From Bucket | To Bucket | Run-off % | To Bucket | Bucket Rank | Contractual Cash Flow (From Bucket) | Contractual Cash Flow (To Bucket) | Run-off (Value) | Revised Cash flow - From Bucket | Revised Cash flow -To Bucket |
| | | | | | | | | | 0%)*4/10 | | (27000+1200 ) |

**Table 51 Assignment Method Leg 1 - Increasing assignment Example 1**

1. **When, EOP Balance Based Assumptions, Assumption Unit = Percentage**

$$Cash\ Flow_{Increasing,Balance\ Based,\%} = (EOP\ Balance \times Assumption\ \%) \times \left(\frac{Bucket\ Rank}{\sum Bucket\ Rank}\right)$$

The example below illustrates, Increasing Cash Flow assignment method based on EOP Balance. Here, EOP Balance (Time Deposits) is assumed as 300000.

| Assumption Category | Assumption Unit | Applied to | Assignment Method | Based On |
|---|---|---|---|---|
| Incremental Cash Flow : Run-off | Percentage | Original Balance | Increasing | EOP Balance |

| Business Assumption | | | | Computation | | | | |
|---|---|---|---|---|---|---|---|---|
| Product | Customer | Primary Bucket | Run-off (%) | Bucket Rank | Primary Bucket | Contractual Cash Outflow (Primary Bucket) | Run-off | Revised Cash Outflow (Primary Bucket) |
| Time Deposits | Customer 1 | 1-1 Days | 10 | 1 | Overnight | 20000 | 10000 (300000*10%)*1/3 | 10000 |
| | | | | 2 | 1-1 Days | 30000 | 20000 (300000*10%)*2/3 | 20000 |

**Table 52 Assignment Method Leg 1 - Increasing assignment Example 2**

### 3. Decreasing Assignment

The Cash flows are assigned to each bucket up to the selected bucket in decreasing order based on ranks assigned to cash flows. Assignments are made in decreasing order to selected level and further assignment is done until the most granular level.

The formulae under different conditions are as follows:

1. **When, Cash Flow Based Assumptions, Assumption Unit = Percentage**

$$Cash\ Flow_{Decreasing,CF\ Based,\%} = (Cash\ Flow_n \times Assumption\ \%) \times \left(\frac{Bucket\ Rank}{\sum Bucket\ Rank}\right)$$

2. **When, Assumption Unit = Value**

$$Cash\ Flow_{Decreasing,\$} = Assumption\ Value \times \left(\frac{Bucket\ Rank}{\sum Bucket\ Rank}\right)$$

The example below illustrates, Decreasing Cash Flow assignment method based on Cash Flow.

| Assumption Category | Assumption Unit | Applied to | Assignment Method | Based On |
|---|---|---|---|---|
| Cash Flow Movement - Run-off | Percentage | Original Balance | Decreasing | Cash Flow |

| Business Assumption | | | | | Computation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Product | Customer | From Bucket | To Bucket | Run-off % | To Bucket | Bucket Rank | Contractual Cash Flow (From Bucket) | Contractual Cash Flow (To Bucket) | Run-off | Revised Cash flow - From Bucket | Revised Cash flow -To Bucket |
| Assets | Customer 1 | 10-10Days | 3-3Days | 10% | Overnight | 4 | 30000 | 20000 | 1200 (30000*10%)*4/10 | 27000 (30000-3000) | 21200 (20000+1200) |
| | | | | | 1-1Days | 3 | | 21000 | 900 (30000*10%)*3/10 | | 21900 (21000+900) |

| Business Assumption | | | | | Computation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Product | Customer | From Bucket | To Bucket | Run-off % | To Bucket | Bucket Rank | Contractual Cash Flow (From Bucket) | Contractual Cash Flow (To Bucket) | Run-off | Revised Cash flow - From Bucket | Revised Cash flow -To Bucket |
| | | | | | 2-2Days | 2 | | 19000 | 600 (30000*10%)*2/10 | | 19600 (19000+600) |
| | | | | | 3-3Days | 1 | | 27000 | 300 (30000*10%)*1/10 | | 30000 (27000+300) |

**Table 53 Assignment Method Leg 1 - Decreasing Assignment Example 1**

### 1. When, EOP Balance Based Assumptions, Assumption Unit = Percentage

$$Cash\ Flow_{Decreasing,Balance\ Based,\%} = (EOP\ Balance \times Assumption\ \%) \times \left(\frac{Bucket\ Rank}{\sum Bucket\ Rank}\right)$$

| Assumption Category | Assumption Unit | Applied to | Assignment Method | Based On |
|---|---|---|---|---|
| Incremental Cash Flow : Run-off | Percentage | Original Balance | Decreasing | EOP Balance |

The example below illustrates, Decreasing Cash Flow assignment method based on EOP Balance. Here, EOP Balance (Time Deposits) is assumed as 300000.

| Business Assumption | | | | Computation | | | | |
|---|---|---|---|---|---|---|---|---|
| Product | Customer | Primary Bucket | Run-off (%) | Bucket Rank | Primary Bucket | Contractual Cash Outflow (Primary Bucket) | Run-off | Revised Cash Outflow (Primary Bucket) |
| Time Deposits | Customer 1 | 1-1 Days | 10 | 2 | Overnight | 20000 | 20000 (300000*10%)*2/3 | 20000 |
| | | | | 1 | 1-1 Days | 30000 | 10000 (300000*10%)*1/3 | 10000 |

**Table 54 Assignment Method Leg 1 - Decreasing Assignment Example 2**

**4. Equal Assignment**

The Cash flows are to be assigned equally up to the selected bucket. Assignments are made equally to the selected level and further assignment is done until the most granular level.

The formulae under different conditions are as follows:

**1. When, Cash Flow Based Assumptions, Assumption Unit = Percentage**

$$Cash\ Flow_{Equal,CF\ Based,\%} = \frac{Cash\ Flow_n \times Assumption\ \%}{Number\ of\ Level\ X\ Buckets}$$

### 2. When, Assumption Unit = Value

$$Cash\ Flow_{Equal\ ,CF\ Based,\$} = \frac{Assumption\ Value}{Number\ of\ Level\ X\ Buckets}$$

The example below illustrates, Equal Cash Flow assignment method based on Cash Flow. Here, Level X buckets are assumed as Higher granular bucket.

| Assumption Category | Assumption Unit | Applied to | Assignment Method | Based On |
|---|---|---|---|---|
| Cash Flow Movement- Run-off | Percentage | Original Balance | Equal | Cash Flow |

| Business Assumption | | | | | Computation | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Product | Customer | From Bucket | To Bucket | Run-off % | To Bucket | Contractual Cash Flow (From Bucket) | Contractual Cash Flow (To Bucket) | Run-off | Revised Cash flow - From Bucket | Revised Cash flow -To Bucket |
| Assets | Customer 1 | 10-10Days | 5-5 Days | 10% | Overnight | 30000 | 20000 | 500 (30000*10%)/6 | 27000 =(30000-3000) | 20500 (20000+500) |
| | | | | | 1-1Days | | 21000 | 500 (30000*10%)/6 | | 21500 (21000+500) |
| | | | | | 2-2Days | | 19000 | 500 (30000*10%)/6 | | 19500 (19000+500) |
| | | | | | 3-3Days | | 27000 | 500 (30000*10 | | 27500 (27000+500) |

| Business Assumption | | | | | Computation | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Product | Customer | From Bucket | To Bucket | Run-off % | To Bucket | Contractual Cash Flow (From Bucket) | Contractual Cash Flow (To Bucket) | Run-off | Revised Cash flow - From Bucket | Revised Cash flow -To Bucket |
| | | | | | | | | %)/6 | | |
| | | | | | 4-4Days | | 13000 | 500 (30000*10 %)/6 | | 13500 (13000+500) |
| | | | | | 5-5Days | | 11000 | 500 (30000*10 %)/6 | | 11500 (11000+500) |

**Table 55 Assignment Method Leg 1 - Equal Assignment Example 1**

**1. When, EOP Balance Based Assumptions, Assumption Unit = Percentage**

$$Cash\ Flow_{Equal\ ,Balance\ Based,\%} = \frac{EOP\ Balance \times Assumption\ \%}{Number\ of\ Level\ x\ Buckets}$$

The example below illustrates, Equal Cash Flow assignment method based on EOP Balance. Here, EOP Balance (Time Deposits) is assumed as 500000.

| Assumption Category | Assumption Unit | Applied to | Assignment Method | Based On |
|---|---|---|---|---|
| Incremental Cash Flow : Run-off | Percentage | Original Balance | Equal | EOP Balance |

| Business Assumption | | | | Computation | | | |
|---|---|---|---|---|---|---|---|
| **Product** | **Customer** | **Primary Bucket** | **Run-off (%)** | **Primary Bucket** | **Contractual Cash Outflow (Primary Bucket)** | **Run-off** | **Revised Cash Outflow (Primary Bucket)** |
| Time Deposits | Customer 1 | 1-1 Days | 10 | Overnight | 20000 | 50000 (500000*10%) | 45000<br>20000+(50000/2) |
| | | | | 1-1 Days | 30000 | | 55000<br>30000 + (50000/2) |

**Table 56 Assignment Method Leg 1 - Equal Assignment Example 2**

**5. Proportionate Assignment**

The Cash flows are assigned to each bucket up to the selected bucket in proportion to the bucket size. Assignments are made proportionately to the selected level and further assignment is done until the most granular level.

The formulae under different conditions are as follows.

1. **When, Cash Flow Based Assumptions, Assumption Unit = Percentage**

$$\boldsymbol{Cash\ Flow_{Proportionate\ ,CF\ Based,\%}} = (\boldsymbol{Cash\ Flow_n} \times \boldsymbol{Assumption}\ \%) \times \frac{\boldsymbol{t}}{\boldsymbol{T}}$$

2. **When, Assumption Unit = Value**

$$\boldsymbol{Cash\ Flow_{Proportionate\ ,\$}} = \boldsymbol{Assumption\ Value} \times \frac{\boldsymbol{t}}{\boldsymbol{T}}$$

The example below illustrates, Proportionate Cash Flow assignment method based on Cash Flow.

Here,

t = Number of days in the given Level x bucket

T= Total number of days up to the selected bucket

| Assumption Category | Assumption Unit | Applied to | Assignment Method | Based On |
|---|---|---|---|---|
| Cash Flow Movement- Run-off | Percentage | Original Balance | Proportionate | Cash Flow |

The time buckets which are considered for the computation are as follows:

| N_BUCKET_NO | V_BUCKET_NAME |
|---|---|
| 1 | Overnight |
| 2 | 1-10Days |
| 3 | 11-15Days |
| 4 | 16-20Days |
| 5 | 21-25Days |

| N_BUCKET_NO | V_BUCKET_NAME |
|---|---|
| 6 | 26-30Days |

| Business Assumption | | | | | Computation | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Product | Customer | From Bucket | To Bucket | Run-off % | To Bucket | Contractual Cash Flow (From Bucket) | Contractual Cash Flow (To Bucket) | Run-off | Revised Cash flow - From Bucket | Revised Cash flow -To Bucket |
| Assets | Customer 1 | 26-30Days | 11-15Days | 10% | Overnight | 30000 | 20000 | 0 (30000*10%)* 0/15 | 27000 =(30000- 3000) | 20000 |
| | | | | | 1-10Days | | 21000 | 2000 (30000*10%)* 10/15 | | 23000 (21000+2000) |
| | | | | | 11-15Days | | 19000 | 1000 (30000*10%)* 5/15 | | 20000 (19000+1000) |

**Table 57 Assignment Method Leg 1 - Proportionate Assignment Example 1**

### 3. When, EOP Balance Based Assumptions, Assumption Unit = Percentage

$$Cash\ Flow_{Proportionate\ ,Balance\ Based,\%} = (EOP\ Balance \times Assumption\ \%) \times \frac{t}{T}$$

The example below illustrates, Proportionate Cash Flow assignment method based on EOP Balance. Here, EOP Balance (Time Deposits) is assumed as 300000.

| Assumption Category | Assumption Unit | Applied to | Assignment Method | Based On |
|---|---|---|---|---|
| Incremental Cash Flow :Run-off | Percentage | Original Balance | Proportionate | EOP Balance |

| Business Assumption | | | | Computation | | | | |
|---|---|---|---|---|---|---|---|---|
| **Product** | **Customer** | **Primary Bucket** | **Run-off (%)** | **Bucket Rank** | **Primary Bucket** | **Contractual Cash Outflow (Primary Bucket)** | **Run-off** | **Revised Cash Outflow (Primary Bucket)** |
| Time Deposits | Customer 1 | 1-10Days | 10 | 1 | Overnight | 20000 | 0<br>(300000*10%)*0/10 | 20000 |
| | | | | 2 | 1-10Days | 30000 | 30000<br>(300000*10%)*10/10 | 60000<br>(30000 + 30000) |

**Table 58 Assignment Method Leg 1 - Proportionate Assignment Example 2**

#### 6.6.3.7 Assignment Method – Leg 2

This option determines how the secondary assumption value is allocated to time buckets. Secondary assumption value refers to the off-set value which can be selected in addition to the primary assumption value. Assignment methods determine the manner in which the primary assumption values are assigned to multiple buckets in order to determine the cash flows. Leg 2 is applicable when only two legs of the transaction are affected i.e. when the assumption legs field value is selected as Two. Secondary assumption value is the off-set value specified by the you in addition to the primary assumption value, and is applicable only when assumption leg is selected as Two. This is applicable only when assumption legs are selected as Two.

The options are as follows:

1. Selected Time Bucket
2. Increasing
3. Decreasing
4. Equal
5. Proportionate

The detailed calculations pertaining to each assignment method are explained in section Assignment Method Leg 1.

#### 6.6.3.8 Intraday Assignment Method – Leg 1 and 2

When the Intraday Assumption is selected as Yes in the Business Assumption Definition window the Intraday Assignment Method – Leg 1 and 2 is applicable.

For Assumptions, which include time bucket as a dimension, Assumption methods are defined in the Business Assumptions window. For each leg of the assumption, the intraday assignment method is chosen separately. Assignment methods signify the method by which payments at a higher level intraday time bucket flow down to lower level intraday time buckets. Assignment methods for intraday assumptions are listed as follows:

- Selected Time Bucket
- Parallel Time Bucket

1. **Selected Time Bucket**

   In this method, payments from one time bucket are aggregated and shifted to another selected time bucket. The size of the source and target time buckets is not same; since aggregation and /or dispersion occurs at a higher time bucket level. This assignment method is available in all assumptions. In case of a payments shift assumption, if the selected buckets are at a higher level, payments get aggregated and dispersed equally at all constituent lower buckets. In case of a drawdown assumption, if the selected bucket is at a higher level, a single drawdown for the input value occurs at any level zero bucket of the higher level. The same principle holds good for offset bucket as well. In case of a payments

default assumption, if the selected residual time bucket is at a higher level, the payments are dispersed equally at all constituent lower buckets.

2. **Parallel Time bucket**

   In this method, payments from one bucket are shifted in parallel to another bucket of the same level as the source bucket. In other words, a constant shift happens to all level 0 buckets constituting the higher level buckets.

   This assignment method is available only for Payments Shift assumption:

   For example: Within a Payments Shift Assumption, if

   - Source bucket (level 3): 11-12 hrs
   - Target Bucket- (level 3): 9-10 hrs

   If the level zero buckets are in minutes, then all payments under 11:00 moves to 09:00 bucket, all payments under 11:01 moves to 09:01 bucket, all payments from 11:02 moves to 09:02 and so on.

   In case of a drawdown and value change assumption, parallel bucket option is not applicable.

#### 6.6.3.9 Assumption Unit

This option helps to identify the unit based on which the assumption is defined. The options which can be selected from the drop-down list are as follows:

- Amount
- Percentage
- Units

**NOTE:** Units are only applicable on selection of the sub category Asset Sale as part of the Cash Flow Movement assumption category).

#### 6.6.3.10 Assumption Currency

This option is applicable only when the assumption unit is selected as Amount. In case, the assumption unit is selected as Amount then following options are displayed:

- Natural Currency
- Currency Selection

**NOTE:** In case you select Natural Currency then the currency must be selected as part of dimension selection.

#### 6.6.3.11 Ratings Downgrade

Ratings downgrade caters to the downgrade of a legal entity's rating. This option identifies the downgrade level for the purpose of triggering the need for additional collateral. This parameter identifies the downgrade specified for a legal entity.

This downgrade can either be specified as:

- Rating Based or,
- Notches Based

**NOTE:** This is applicable only on selection of the sub category Encumbrance and Ratings Downgrade as part of the assumption categories Incremental Cash Flow or Encumbrance.

#### 6.6.3.12 Transaction Legs

This option determines if one or two off-set legs are required for the purpose of specifying the business assumption value as part of the assumption specification section. This is based on the product type. For instance, in case of loans, deposits etc. there is only one primary leg and one off-set leg whereas in case of swaps there are two primary and two off-set legs for the same transaction.

One of the following options is selected:

- **One**: In case option One is selected, only one column for the specification of each assumption leg is displayed as part of the assumption specification table that is, one column each for primary and off-set assumption value specification.
- **Two**: In case option Two is selected, two columns are displayed for specifying each assumption leg that is two columns each for primary and off-set assumption value specification.

#### 6.6.3.13 Charge Penalty

The Charge Penalty options are as follows:

- **Yes**: In case you select Yes, an additional column in the assumption value grid is added to specify penalty.
- **No**: If No is selected, no Penalty is required.

**NOTE:** This option is enabled only for the following assumption sub-categories under Cash Flow Movement category:

- Cash Flow Movement
- Prepayment
- Cash Flow Delay

#### 6.6.3.14 Specify Collateral/Underlying

This option determines if existing unencumbered assets are required to be posted as collateral or underlying in the case of secured funding and repo transactions. The options are as follows:

- **Yes**: If Yes is selected, existing assets can be posted as collateral for each row in the assumption specification table.
- **No**: If No is selected, no collateral is required.

#### 6.6.3.15 Sale Specification By

When the assumption category is selected as Cash Flow Movement and the sub category is selected as Asset Sale, Sale Specification By field is allowed for selection. The two ways to specify a sale are as follows:

- **Individual Assets** - You can specify a sale by selecting the assets individually. In the dimension browser you have only Asset browser. Here, you much select each individual asset which you need to sell.
- **Dimensions** – You can select the relevant dimensions such as Product ,Currency and Rating. You are allowed to select individual members within this and all assets which have asset dimensional attributes that are selected are sold. All individual assets that have the attributes of the selected dimensions and dimension members are sold.

### 6.6.4 Dimension Selection

The two steps to select Dimensions are as follows:

- **Dimension Selection**: One or multiple dimensions can be selected from a list of dimensions displayed in the dimension browser. The selected dimensions are displayed in the dimension selection section and as columns in the assumption specification table. You are allowed to drag and drop the dimensions which are displayed as part of the dimension selection section for sequencing the dimensions. In case the sequence of dimensions is changed, the respective columns in the assumption specification table get re-arranged.

  In case new dimensions are added to an existing definition, the assumption specification table is re-formed and all assumption values are re-set.
- **Dimension Member Selection**: One or multiple members can be selected for each selected dimension. These are displayed as row items in the assumption specification table. In case you change any dimension member or add any new dimension to the existing definition the grid will be reset.

For explanation on how to add dimensions which are displayed in the BAU window under the Dimension browser, refer section Aggregation Dimension Selection.

For more details on list dimensions, refer section Annexure: Functional Details, section A. Data Flow and Dimensions

### 6.6.5 Time Bucket Definition Selection

The three steps to select Time Buckets are as follows:

- **Time Bucket Definition Selection**: One time bucket definition can be selected from a list of definitions displayed in the time bucket definition browser. Here it is a single selection. Only one time bucket can be selected. The values which are defined in the Time Bucket definition window are displayed here. For more information refer Time Buckets section. On selection of the time bucket definition, it is displayed in the time bucket definition selection against both <Time Bucket 1> Selection and <Time Bucket 2> Selection.
- **<Time Bucket 1> Selection**: One or multiple time buckets from the given time bucket definition can be selected as part of <Time Bucket 1> Selection. The selected time buckets are displayed as row items in the assumption specification table. The name of this parameter changes depending upon on the assumption category selected as per the mapping provided below:

| Assumption Category | <Time Bucket 1> Selection |
|---|---|
| Cash Flow Movement | From Bucket Selection |
| Incremental Cash Flows | Primary Bucket Selection |
| Encumbrance | From Bucket Selection |
| Value Change | Not Applicable |

**Table 59 Time Bucket 1 Selection**

- <**Time Bucket 2> Selection**: One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of <Time Bucket 2> Selection. The time buckets selected are displayed as drop-down values in the <Time Bucket 2> column in each row of the assumption specification table. The name of this parameter changes depending upon the assumption category selected as per the mapping provided below:

| Assumption Category | <Time Bucket 2> Selection |
|---|---|
| Cash Flow Movement | To Bucket Selection |
| Incremental Cash Flows | Off-set Bucket Selection |
| Encumbrance | To Bucket Selection |
| Value Change | Not Applicable |

**Table 60 Time Bucket 2 Selection**

**NOTE:**

Time Bucket Selection is not applicable when the assumption category is selected as value change.

The values which are defined in the Time Bucket definition window are displayed as part of Time Bucket Definition Selection section in the Business Assumptions Definitions window.

When the Intraday Assumption is selected as Yes in the Business Assumption Definition window, only the Intraday Time Buckets are displayed in this section.

### 6.6.6 Cash Flow Interval Selection

The Cash flow interval selection allows the user to select appropriate cash flow time bands as required in the business assumption. This field appears and is applicable only to the following combination of category, sub category and based on measures:

| Category | Sub category | Based on measures |
|---|---|---|
| Value change | Required stable funding factor | Cash flows |
| | Available stable funding factor | Cash flows |
| | | Total stable cash flows |
| | | Total less stable cash flows |
| | | Operational cash flows |
| | | Non operational cash flows |

For the above combinations, the selection of a cash flow interval is mandatory for assumption definition. By choosing the cash flow intervals, the user allows the cash flows to be grouped in time in accordance with the definition.

### 6.6.7 Assumption Parameter Specification

The assumption parameter specification table is generated after all the assumption properties, dimensions and time buckets are selected. This displays the dimensions selected as column values and the dimension members as row values. Additionally, it displays one or two time bucket columns based on the assumption properties selected.

The names of these columns change based on the assumption category selected as follows:

| Assumption Category | <Time Bucket 1> | <Time Bucket 2> |
|---|---|---|
| Cash Flow Movement | From Bucket | To Bucket |
| Incremental Cash Flows | Primary Bucket | Off-set Bucket |
| Encumbrance | From Bucket | To Bucket |
| Value Change | Not Applicable | Not Applicable |

**Table 61 Assumption Specification**

## 6.7 Understanding Business Assumption Summary

**NOTE:** Time bucket definitions have to be created before defining a new business assumption. Refer section Time Buckets for more information.

In **Oracle Financial Services Analytical Applications Infrastructure** home screen select, **Financial Services Liquidity Risk Management.**

To open the **Business Assumptions** window, choose **Liquidity Risk Management** > **Business Assumptions** on the Left-Hand Side (LHS) menu.

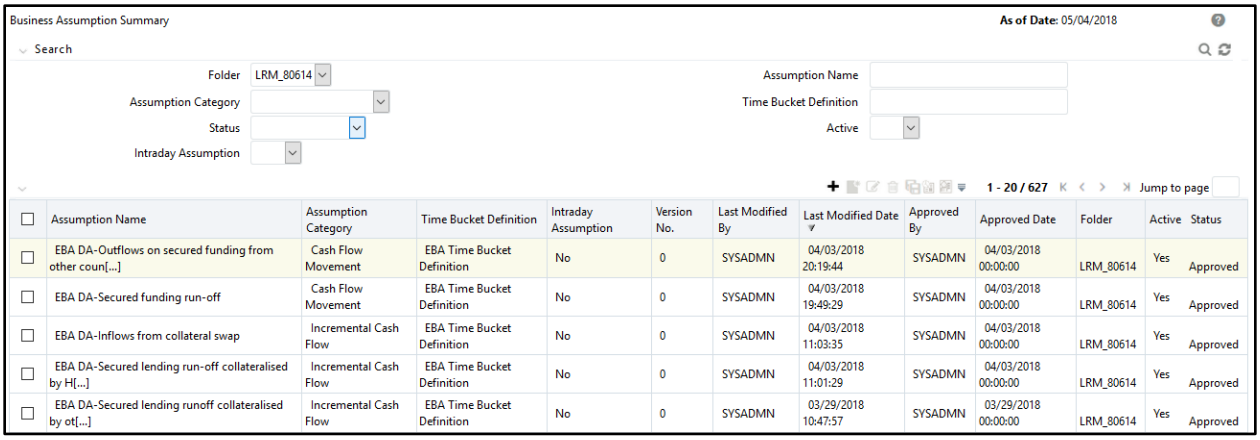



**Figure 16 Business Assumption Summary**

The Business Assumption Summary window displays the following fields. The definitions based on the search criteria are listed under List of Business Assumptions.

This is the search section which contains multiple parameters. You can specify one or multiple search criteria in this section. When you click the search icon, depending up on the search criteria, this filters and displays the relevant search combination parameters under the Business Assumption Summary as a list.

| **Search** | |
|---|---|
| **Field\Icon** | **Description** |
| Search  | This icon allows you to search the Assumption on the basis of the search criteria specified. Search criteria include a combination of Folder, Assumption Name, Assumption Category, Time Bucket Definition, Status, and Active Status. The business assumptions displayed in the List of Business Assumptions table are filtered based on the search criteria specified on clicking of this icon. |
| Reset  | This icon allows you to reset the search section to its default state that is, without any selections. Resetting the search section displays all the existing business assumption definitions in the List of Business Assumptions table. |
| Folder | This field allows you to search for the pre-defined business assumption definitions on the basis of the selected folder. This field displays a list of folders that you have access to as a drop-down. Selection of a folder from the drop down list displays only those business assumptions that have been defined within the selected folder/segment in the List of Business Assumption table. |
| Assumption Name | This field allows you to search the pre-defined business assumption definitions on the basis of the assumption name. Enter the assumption name. |
| Assumption Category | This field allows you to search the pre-defined business assumption definitions on the basis of the assumption category. This field displays a list of categories that you have access to as a drop-down. Selection of a assumption category from the drop down list displays only those business assumptions that have been defined within the selected assumption category in the List of Business Assumption table. |
| Time Bucket Definition | This field allows you to search the pre-defined business assumption definitions on the basis of the Time Bucket Definition. Enter time bucket definition which was defined in the time bucket definition window. |
| Status | This field allows you to search the pre-defined business assumption definitions on the basis of approval status. This field displays a list of statuses that you have access to as a drop-down that is, Approved, Draft, In Review, Open, Pending Approval or Retired. Click the drop-down list to select Approved or Rejected status. Selection of a status from the drop-down list displays only those business assumptions that have been defined within the selected status in the List of Business Assumption table. |
| Active | This field allows you to search the pre-defined business assumption definitions on the basis of active status. This field displays a status that you have access to as a drop-down that is, Yes or No. Selection of a status from the drop-down list displays only those business assumptions that have been defined within the |

| Search | |
|---|---|
| **Field\Icon** | **Description** |
| | selected status in the List of Business Assumption table. |
| Intraday Assumption | This field allows you to search the Intraday business assumption defined. This field displays options in the drop-down Yes or No. Selection of a Yes from the drop-down list displays only those intraday business assumptions that have been defined in the List of Business Assumption table. Selection of a No from the drop-down list displays only those business assumptions apart from intraday assumptions that have been defined in the List of Business Assumption table. |

**Table 62 Business Assumptions - Search**

| List of Business Assumptions | | |
|---|---|---|
| **Icon Name** | **Icon** | **Description** |
| Add |  | This icon allows you to define a new assumption. |
| View |  | This icon allows you to view the selected assumption. |
| Edit |  | This icon allows you to edit the selected assumption. |
| Delete |  | This icon allows you to delete the selected assumption. |
| Copy |  | The icon allows a definition to be copied and resaved as a new definition. |
| Make Active |  | This icon allows activating the selected version of the assumption. The active version of the assumption is considered for Run definition. |
| Workflow Summary |  | The icon displays the approval summary for the definition. |

**Table 63 Business Assumptions Summary**

## 6.8 Defining a New Business Assumption

Business Assumption Definition window allows you to define a new assumption definition in the LRM Application.

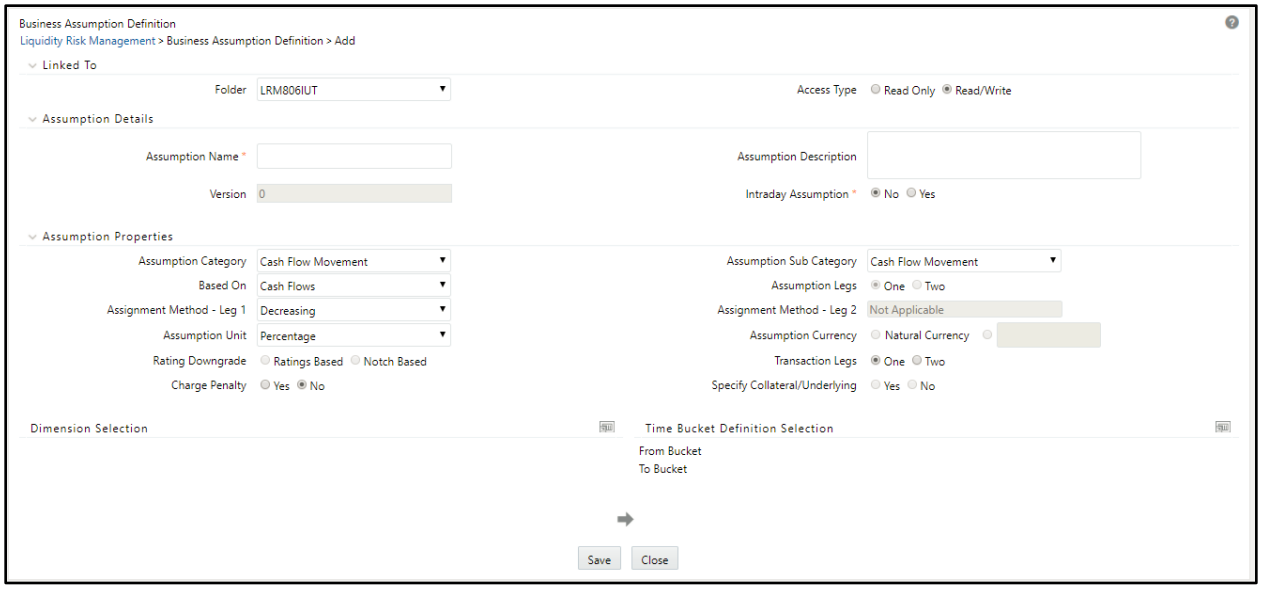



**Figure 17 Business Assumption Definition**

To create a new business assumption, perform the following steps:

1. Click + icon on the **Business Assumption Summary** window.

   The **Business Assumption Definition** window is displayed where you can define new business assumption definition.

2. In **Linked To** section,
   a. Select the **Folder** from the drop-down list, which is specific to the business assumption definition.
   b. Select the **Access Type**. It either is Read/Write or Read Only option.
3. In **Assumption Detail** section,
   a. Enter the **Assumption Name** which is unique across infodoms. This field allows special characters.
   b. Enter the **Assumption Description**. This field allows special characters.

      Note:

      - Both the **Assumption Name** and **Assumption Description** fields allow special characters.
      - **Version Number** for the assumption is generated automatically.

   c. Select if it is an **Intraday Assumption**, either **Yes** or **No**.
4. In **Assumption Properties** section,
   a. Select the **Assumption Category** from the drop-down list. The drop-down list displays the following:
      - Cash Flow Movement
      - Incremental Cash Flow
      - Encumbrance

- Value Change

b. Each assumption category has a sub-category associated with it, which has to be selected from the Assumption Sub-Category drop-down list. Detailed description on the assumption categories and sub-categories are provided as part of Selecting Assumption Category section.

   **Note**: In case Intraday Assumption is selected as Yes, then intraday specific categories and sub-categories are displayed.

c. Choose the measure to which the assumption parameter values are applied in order to calculate the cash flows from the **Based On** drop-down list. Refer to section Based On for a detailed list.

d. Select the number of **Assumption Legs** for which the assumption parameter values are to be specified as either One or Two. Refer to section Assumption Legs for more details on assumption legs.

e. Select the **Assignment Method – Leg 1** from the drop-down list, that is Selected Time Bucket, Increasing, Decreasing, Equal or Proportionate. The specific methods in which the assumption value can be assigned across multiple buckets are detailed as part of section Assignment Method Leg 1

f. Select the **Assignment Method – Leg 2** from the drop-down list. That is, Selected Time Bucket, Increasing, Decreasing, Equal or Proportionate. The specific methods in which the assumption value can be assigned across multiple buckets are detailed as part of section Assignment Method leg 2.

g. Select the **Assumption Unit** from the drop-down list as one of the following options: Amount, Percentage or Unit. Unit is applicable when Sale is specified. This parameter is the unit based on which the assumption values are specified. For more information refer section Assumption Unit.

h. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. For more information refer section Assumption Currency

   You can either select the option as Natural Currency or choose any other currency from the drop-down list which is required as part of the definition.

i. Select the **Rating Downgrade** option. That is, Notch Based or Ratings Based. These are enabled when the assumption sub category is selected as Ratings Downgrade. For more information refer section Ratings Downgrade.

j. Choose the **Transaction Leg** option that is, One or Two. One of the following options is selected. For more information refer section Transaction Legs.

k. Choose the **Charge Penalty** option that is, Yes or No. In case you select Yes, an additional column in the assumption value grid is added to specify penalty. This option is enabled only for specific assumptions. For more information refer section Charge Penalty.

l. Choose **Specify Collateral/Underlying** option as either Yes or No. This parameter determines if existing unencumbered assets are required to be posted as collateral or

underlying that is, in case of secured funding and repo transactions. For more information refer section Specify Collateral/Underlying

m. When the assumption category is selected as Cash Flow Movement and the sub category is selected as Asset Sale, **Sale Specification By** field is allowed for selection. Choose either Individual Assets or Dimensions to specify a sale. For more information refer section Sale Specification By.

5. In **Dimension Selection**, perform the following steps:

   a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.

   b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.

   c. Click to move the selected dimensions, or click to move all the members to the Selected Members section.

   d. Click **OK**. The selected dimensions are displayed in the dimension selection section.

   e. Click the selected dimension member. The Hierarchy Browser window is displayed.

   f. Select one or multiple members from the list of dimensions displayed in the Hierarchy browser. Click to move the selected dimensions, or click to move all the dimensions to the Selected Members section.

   g. Click **OK**.

   **Note**:

   - In the dimension panel, you can add a maximum of seven dimensions.
   - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

6. In **Time Bucket Definition Selection**, perform the following steps:

   a. Click icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

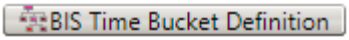
   b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Here it is a single selection. Only one time bucket can be selected. The values which are defined in the Time Bucket definition window are displayed here.

   c. Click **OK**. The selected time bucket definition, is displayed in the time bucket definition selection against both <Time Bucket 1> Selection, and <Time Bucket 2> Selection.

   d. For **<Time Bucket 1> Selection**, click BIS Time Bucket Definition icon.

   One or multiple time buckets from the given time bucket definition can be selected as part of <Time Bucket 1> Selection. The selected time buckets are displayed as row items in the assumption specification table. The name of this parameter changes depending upon on the assumption category selected as per the mapping provided below:\

| Assumption Category | <Time Bucket 1> Selection |
|---|---|
| Cash Flow Movement | From Bucket Selection |
| Incremental Cash Flows | Primary Bucket Selection |
| Encumbrance | From Bucket Selection |
| Value Change | Not Applicable |

e. For **<Time Bucket 2> Selection**, click 

icon.

One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of <Time Bucket 2> Selection. The time buckets selected are displayed as drop-down values in the <Time Bucket 2> column in each row of the assumption specification table. The name of this parameter changes depending upon the assumption category selected as per the mapping provided below:

| Assumption Category | <Time Bucket 2> Selection |
|---|---|
| Cash Flow Movement | To Bucket Selection |
| Incremental Cash Flows | Off-set Bucket Selection |
| Encumbrance | To Bucket Selection |
| Value Change | Not Applicable |

**Note**: When the Intraday Assumption is selected as Yes in the Business Assumption Definition window, only the Intraday Time Buckets are displayed in this section

7. In **Cash Flow Interval Selection**, perform the following steps:
   a. Click  icon for **Cash Flow Interval Selection**. The Cash Flow Interval Selection browser window is displayed.
   b. Select a defined cash flow interval displayed in the browser.
   c. Click **OK**. The selected Cash Flow Interval is displayed in the Cash Flow Interval selection section.
   d. Click the selected dimension member. The Hierarchy Browser window is displayed.
   e. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected member, or click  to move all the members, to the Selected Members section.
   f. Click **OK**.
8. After the assumption parameters are selected,
   a. Click  icon on the **Business Assumption Definition** window.

   The **Assumption Parameter Specification** table is generated. This displays the dimensions selected as column values and the dimension members as row values.

Additionally, it displays one or two time bucket columns. The names of these columns change based on the assumption category selected as follows:

| Assumption Category | <Time Bucket 1> | <Time Bucket 1> |
|---|---|---|
| Cash Flow Movement | From Bucket | To Bucket |
| Incremental Cash Flows | Primary Bucket | Off-set Bucket |
| Encumbrance | From Bucket | To Bucket |
| Value Change | Not Applicable | Not Applicable |

b. You are allowed to sort and filter on each dimension column.

c. The dimensions columns are re-arranged based on drag and drop enabled in the Dimension Selection section.

d. To delete a table row in assumption specification, select a row and then click icon.

e. To add a sub row to each row, for instance to specify multiple <Time Bucket 2>, select a row and then click icon.

f. To delete sub rows, right-click on the sub row to delete.

g. To enable Collateral Posting, select a row and then click icon. The **Asset Browser** window with only unencumbered assets is displayed.

**Note**: This icon is enabled only when the Post Collateral parameter is selected as Yes.

The assets that are unencumbered during the selected period are displayed even if they are encumbered currently. These are allowed to be posted as collateral for the unencumbered period.

- After selecting the members, Click to move the selected member, or click to move all the members, to the Selected Members section, and click **OK**.
- The selected collateral is displayed in the respective row in Assumption Specification. Encumbrance value can be specified as a percentage against each collateral. This column enables specification of partial encumbrance. You can select one or multiple members for each selected dimension. These are displayed as sub rows against the dimensional combination row for which this is being specified in the assumption specification table.

9. To save the definition, click **Save**.
10. To go back to the Business Assumption Definition Summary window, click **Close**.

**Note**:

- Stress assumptions are defined in the business assumption definition window in a manner similar to that explained above. These assumptions will have adverse values for Run-offs, rollovers, draw downs, haircuts and so on. The dimensions used for stress testing may also be different

from those under BAU conditions. However, the process of defining a stress business assumption does not change.

- After you save a Business Assumption, it is registered as a process in the Rules Framework of Oracle Financial Services Analytical Applications Infrastructure.
- A Business Assumption is available for selection in the Run Management window only after it is approved.
- In case a Business Assumption is edited, it is saved as a new version.
- After including additional dimension members the existing assumption specification table must not be reset.

## 6.9 Parameters Applicable to Each Assumption Category

The Assumption Category field in Business Assumption Definition window consists of the following four broad categories:

1. Cash Flow Movement
2. Encumbrance
3. Incremental Cash Flow
4. Value Change

Each of the assumption categories has a sub category which is explained in detailed below.

**NOTE:** The below dimensions are specific to NSFR assumptions, and should not be used for LCR assumptions:

- LRM - NSFR Residual Maturity Band
- LRM - NSFR Encumbered Band
- LRM - Buy Sell Dimension
- Account Defaulted Flag
- Margin Type
- LRM - Encumbrance Status Flag
- LRM - BIS - NSFR Cash Flow Interval

### 6.9.1 Cash Flow Movement

In Assumption Parameters, when you select the Assumption Category as **Cash Flow Movement** from the drop-down list the following sub-categories are available for selection:

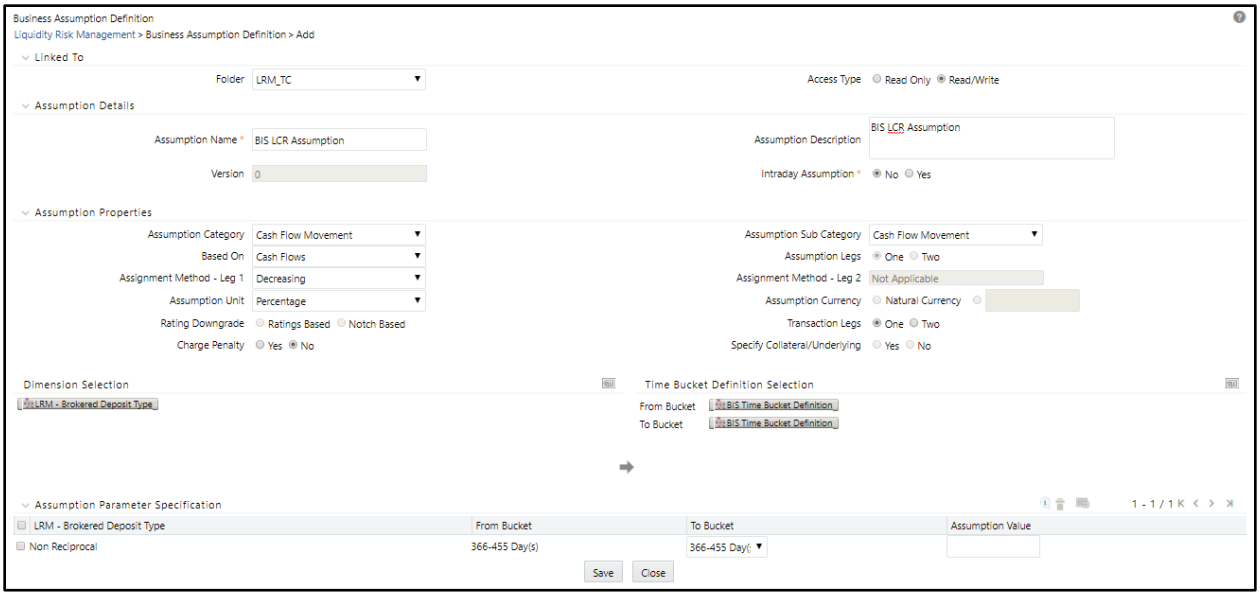
- Cash Flow Movement
- Asset Sale

- Cash Flow Delay
- Delinquency
- Prepayment
- Recovery
- Rollover
- Run-off

**NOTE:** Depending upon the assumption category and sub-categories selected, assumption parameters are defined.

### 6.9.1.1 Cash Flow Movement

When the assumption sub-category is selected as Cash Flow Movement, perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
   - Cash Flows
   - EOP Balance
   - Fair Value
   - Fair Value of Collateral Posted
   - Fair Value of Collateral Received
   - High Run-off Category 1 Balance
   - High Run-off Category 2 Balance

- High Run-off Category 3 Balance
- Highly Stable Balance
- Insured Balance
- Less Stable Balance
- Market Value
- Market Value of Collateral Posted
- Market Value of Collateral Received
- Stable Balance
- Uninsured Balance

**Note**: If cash flows are selected, then the dimensions at cash flow and account granularity are displayed. If not, only account granularity dimensions are displayed.

2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Cash Flow Movement. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. Select the **Assignment Method – Leg 1** from the drop-down list:
    - Selected Time Bucket
    - Increasing
    - Decreasing
    - Equal
    - Proportionate
4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

   **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. Choose the **Transaction Leg** option that is, One or Two.
    - If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for From and To assumption value specification.
    - If Two is selected, two columns are displayed for the specification of each assumption leg that is two columns each for From and To assumption value specification. The products for which two transaction legs are applicable are collateral swaps, inter-state swaps and similar products.

7. Choose the **Charge Penalty** option that is, Yes or No. In case you select Yes, an additional column in the assumption value grid is added to specify Amount or Percentage as per the selection.
8. In **Dimension Selection**, perform the following steps:
    a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
    c. Click  to move the selected dimensions, or click  to move all the members to the Selected Members section.
    d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
    e. Click the selected dimension member. The Hierarchy Browser window is displayed.
    f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members, or click  to move all members to the Selected Members section.
    g. Click **OK**.

    **Note**:

    - In the dimension panel, you can add only seven dimensions.
    - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added

9. In **Time Bucket Definition Selection**, perform the following steps:
    a. Click  icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.
    b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.
    c. Click **OK**. The selected time bucket definition is displayed in the time bucket definition selection against both **From Bucket** selection, and **To Bucket** selection.
    d. For **From Bucket**, click the selected time bucket icon.

    One or multiple time buckets from the given time bucket definition can be selected as part of From Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

    e. For **To Bucket**, click the selected time bucket icon.

    One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of To Bucket selection. The time buckets selected are displayed as drop-down values in the To Bucket column in each row of the assumption specification table.

11. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

The Assumption Parameter Specification table has the following columns:

- Each selected dimension
- From Bucket
- To Bucket
- Assumption Value – Leg 1 (if Transaction Legs is one)
- Assumption Value – Leg 2 (if Transaction Legs is two)
- Penalty (if charge penalty is yes)

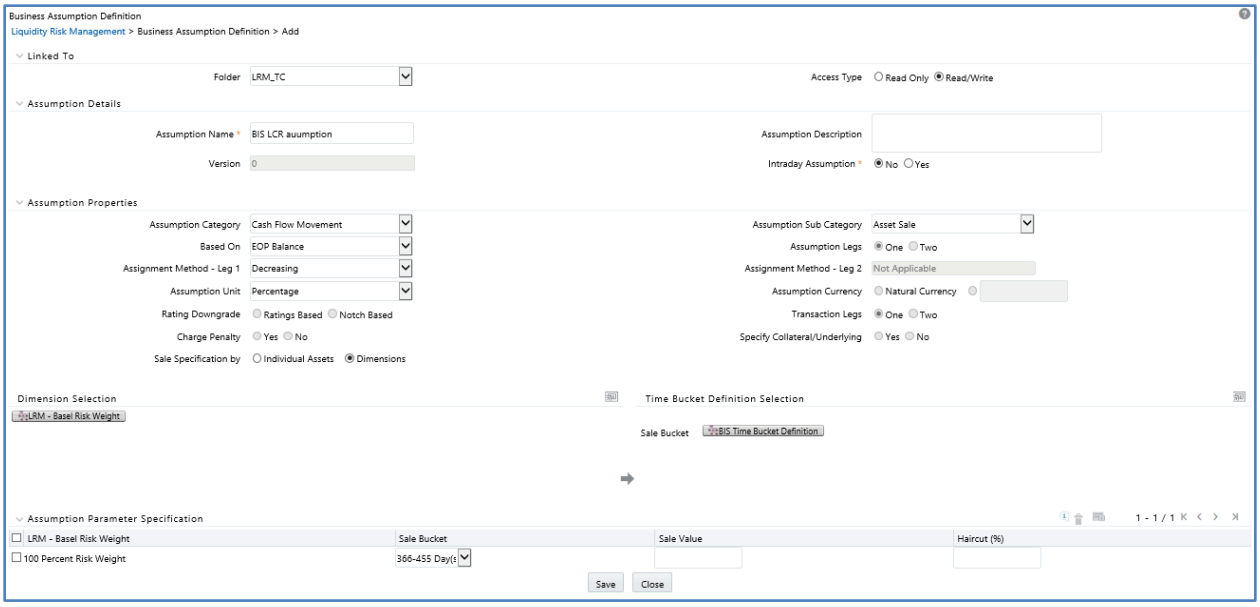
The unique combinations of selected dimension members and the from buckets are displayed as rows.

12. To save the definition, click **Save**.

**NOTE:** Refer section Cash Flow Movement for detailed explanation and calculations.

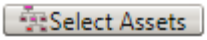
### 6.9.1.2 Asset Sale

When the assumption sub-category is selected as Asset Sale, perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
   - EOP Balance
   - Fair Value
   - Market Value

2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Asset Sale. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. Select the **Assignment Method – Leg 1** from the drop-down list:
    - Selected Time Bucket
    - Increasing
    - Decreasing
    - Equal
    - Proportionate
4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

    **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
7. Select the **Sale Specification by**. It is either Individual Assets or Dimensions.
8. If you select Individual Assets, perform the following steps:
    a. In the **Asset Browser Selection**, click 

 icon. The Asset Browser window appears.
    b. Select the Asset Type, enter Name and Account ID.
    c. Select one or multiple members from a list of members displayed.
    d. Click  to move the selected members to Selected Members section, or click  to select all members.
    e. Click **OK**.
9. If you select Dimensions, in **Dimension Selection**, perform the following steps:
    a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
    c. Click  to move the selected dimensions to Selected Members section, or click  to select all dimensions.
    d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
    e. Click the selected dimension member. The Hierarchy Browser window is displayed.

f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected dimensions to Selected Members section, or click  to select all dimensions.

g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

10. In **Time Bucket Definition Selection**, perform the following steps:

a. Click  icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.

c. Click **OK**. The selected time bucket definition, is displayed in the time bucket definition selection against **Sale Bucket** selection.

d. For **Sale Bucket**, click the selected time bucket icon.

One or multiple time buckets from the given time bucket definition can be selected as part of Sale Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

11. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

The Assumption Parameter Specification table has the following columns:

- Each selected dimension (if Sale Specification by is Dimensions)
- Each selected asset (if Sale Specification by is Individual Assets)
- Sale Bucket
- Sale Value
- Haircut (in %)

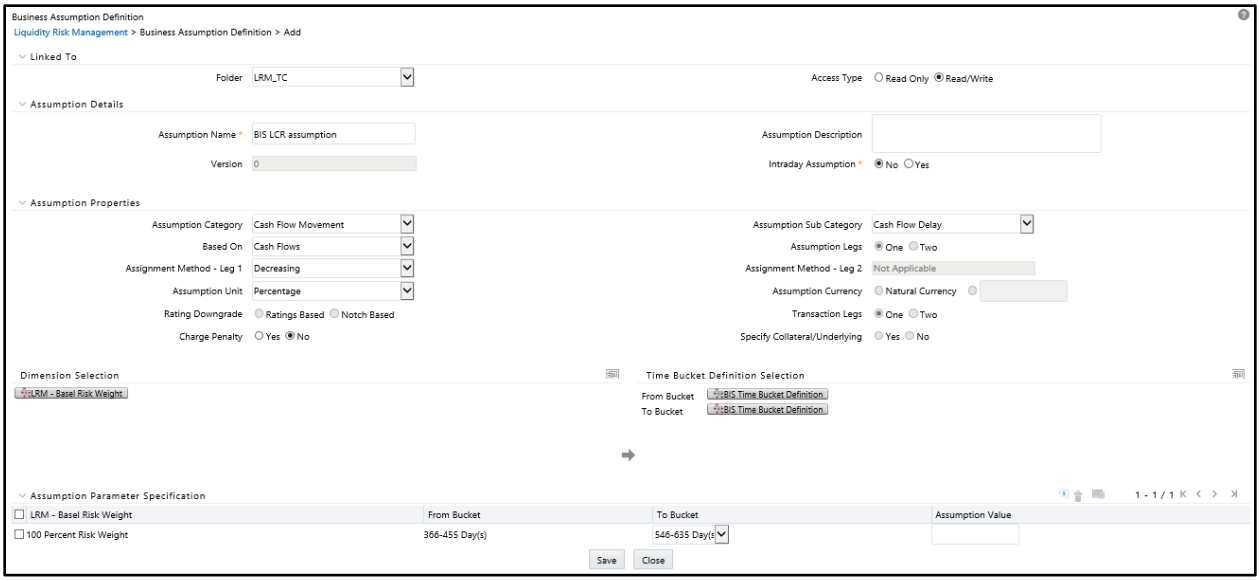
The unique combinations of selected dimension members and the from buckets are displayed as rows.

12. To save the definition, click **Save**.

**NOTE:** Refer section Asset Sale for detailed explanation and calculations.

#### 6.9.1.3 Cash Flow Delay

When the assumption sub-category is selected as Cash Flow Delay, perform the following steps:




1. From the **Based On** drop-down list, the parameter available for selection is **Cash Flows** which is applied on different assumption values.
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Cash Flow Delay. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. Select the **Assignment Method – Leg 1** from the drop-down list:
    - Selected Time Bucket
    - Increasing
    - Decreasing
    - Equal
    - Proportionate
4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

    **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
7. Choose the **Charge Penalty** option that is, Yes or No. In case you select Yes, an additional column in the assumption value grid is added to specify Amount or Percentage as per the selection.
8. In **Dimension Selection**, perform the following steps:

a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.

b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.

c. Click  to move the selected members to Selected Members section, or click  to select all members.

d. Click **OK**. The selected dimensions are displayed in the dimension selection section.

e. Click the selected dimension member. The Hierarchy Browser window is displayed.

f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.

g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

9. In **Time Bucket Definition Selection**, perform the following steps:

a. Click  icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.

c. Click **OK**. The selected time bucket definition is displayed in the time bucket definition selection against both **From Bucket** selection, and **To Bucket** selection.

d. For **From Bucket**, click the selected time bucket icon.

One or multiple time buckets from the given time bucket definition can be selected as part of From Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

e. For **To Bucket**, click the selected time bucket icon.

One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of To Bucket selection. The time buckets selected are displayed as drop-down values in the To Bucket column in each row of the assumption specification table.

9. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

The Assumption Parameter Specification table has the following columns:

- Each selected dimension
- From Bucket

- To Bucket
- Assumption Value
- Penalty (if charge penalty is yes)

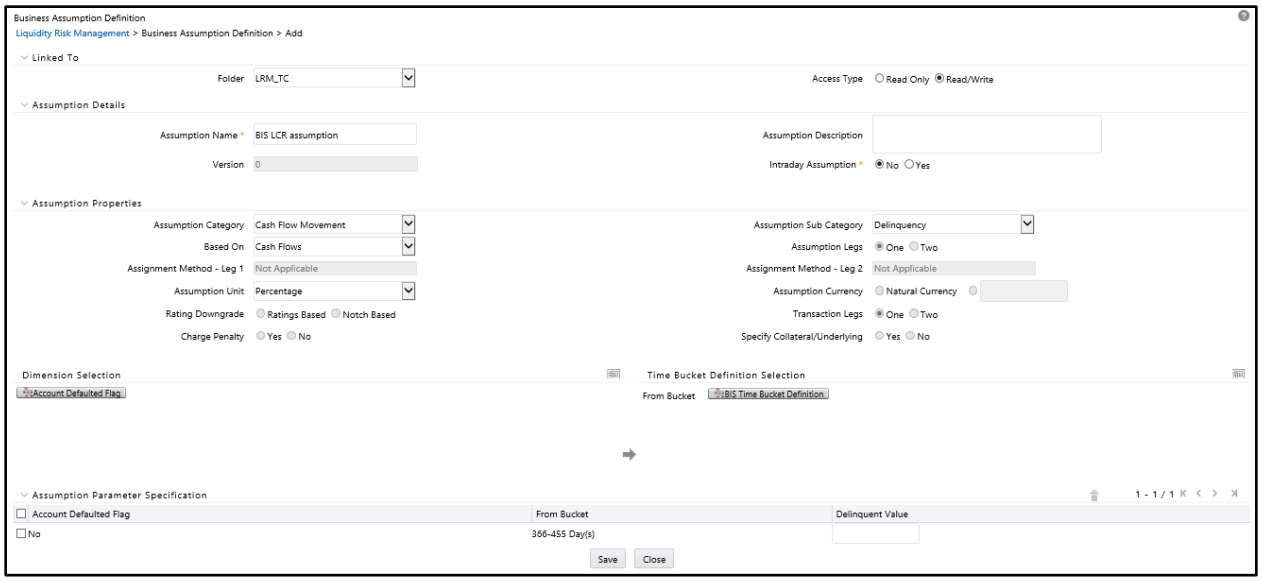
The unique combinations of selected dimension members and the from buckets are displayed as rows.

10. To save the definition, click **Save**.

**NOTE:** Refer section Cash Flow Delay for detailed explanation and calculations.

### 6.9.1.4 Delinquency

When the assumption sub-category is selected as Delinquency, perform the following steps:




1. From the **Based On** drop-down list, the parameter available for selection is **Cash Flows** which is applied on different assumption values.
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Delinquency. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. Select the **Assignment Method – Leg 1** from the drop-down list:
   - Selected Time Bucket
   - Increasing
   - Decreasing
   - Equal
   - Proportionate
4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.

5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

   **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.

6. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.

7. In **Dimension Selection**, perform the following steps:

   a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.

   b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.

   c. Click  to move the selected members to Selected Members section, or click  to select all members.

   d. Click **OK**. The selected dimensions are displayed in the dimension selection section.

   e. Click the selected dimension member. The Hierarchy Browser window is displayed.

   f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.

   g. Click **OK**.

      **Note**:

      - In the dimension panel, you can add only seven dimensions.
      - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

8. In **Time Bucket Definition Selection**, perform the following steps:

   a. Click  icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

   b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.

   c. Click **OK**. The selected time bucket definition is displayed in the time bucket definition selection against **From Bucket** selection.

   d. For **From Bucket**, click the selected time bucket icon.

      One or multiple time buckets from the given time bucket definition can be selected as part of From Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

9. After the assumption parameters are selected, click icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

   The Assumption Parameter Specification table has the following columns:

   - Each selected dimension
   - From Bucket
   - Delinquent Value

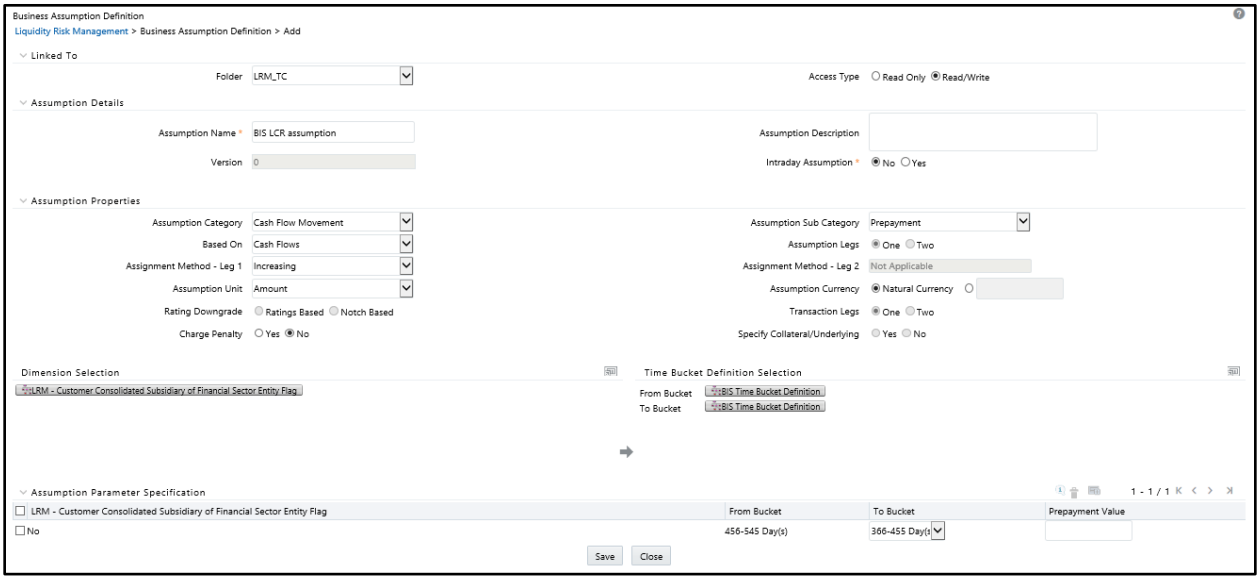
   The unique combinations of selected dimension members and the from buckets are displayed as rows.

10. To save the definition, click **Save**.

**NOTE:** Refer section Delinquency for detailed explanation and calculations.

### 6.9.1.5 Prepayment

When the assumption sub-category is selected as Prepayment, perform the following steps:




1. From the **Based On** drop-down list, the parameter available for selection is **Cash Flows** which is applied on different assumption values.
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Prepayment. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. Select the **Assignment Method – Leg 1** from the drop-down list:
   - Selected Time Bucket
   - Increasing
   - Decreasing
   - Equal

- Proportionate

4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

   **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
7. In **Dimension Selection**, perform the following steps:
   a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
   b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
   c. Click to move the selected members to Selected Members section, or click to select all members.
   d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
   e. Click the selected dimension member. The Hierarchy Browser window is displayed.
   f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click to move the selected members to Selected Members section, or click to select all members.
   g. Click **OK**.

      **Note**:

      - In the dimension panel, you can add only seven dimensions.
      - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added
8. In **Time Bucket Definition Selection**, perform the following steps:
   a. Click icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.
   b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.
   c. Click **OK**. The selected time bucket definition is displayed in the time bucket definition selection against both **From Bucket** selection, and **To Bucket** selection.
   d. For **From Bucket**, click the selected time bucket icon.

One or multiple time buckets from the given time bucket definition can be selected as part of From Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

e. For **To Bucket**, click the selected time bucket icon.

One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of To Bucket selection. The time buckets selected are displayed as drop-down values in the To Bucket column in each row of the assumption specification table.

11. After the assumption parameters are selected, click icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

    The Assumption Parameter Specification table has the following columns:

    - Each selected dimension
    - From Bucket
    - To Bucket
    - Prepayment Value
    - Penalty (if charge penalty is yes)

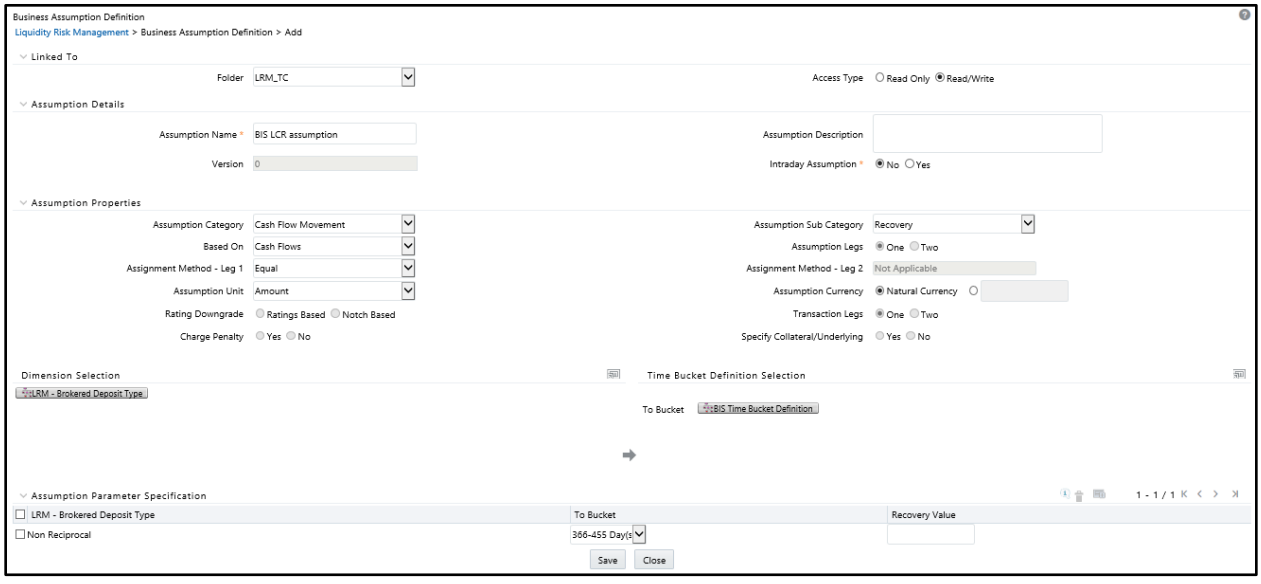
    The unique combinations of selected dimension members and the from buckets are displayed as rows.

12. To save the definition, click **Save**.

**NOTE:** Refer section Prepayment for detailed explanation and calculations.

### 6.9.1.6 Recovery

When the assumption sub-category is selected as Recovery, perform the following steps:




1. From the **Based On** drop-down list, the parameter available for selection is **Cash Flows** which is applied on different assumption values.

2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Recovery. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. Select the **Assignment Method – Leg 1** from the drop-down list:
    - Selected Time Bucket
    - Increasing
    - Decreasing
    - Equal
    - Proportionate
4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

    **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
7. In **Dimension Selection**, perform the following steps:
    a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
    c. Click  to move the selected members to Selected Members section, or click  to select all members.
    d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
    e. Click the selected dimension member. The Hierarchy Browser window is displayed.
    f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.
    g. Click **OK**.

        **Note**:
        - In the dimension panel, you can add only seven dimensions.
        - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.
8. In **Time Bucket Definition Selection**, perform the following steps:

a. Click icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.

c. Click **OK**. The selected time bucket definition is displayed in the time bucket definition selection against **To Bucket** selection.

d. For **To Bucket**, click the selected time bucket icon.

One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of To Bucket selection. The time buckets selected are displayed as drop-down values in the To Bucket column in each row of the assumption specification table.

13. After the assumption parameters are selected, click icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

    The Assumption Parameter Specification table has the following columns:

    - Each selected dimension
    - To Bucket
    - Recovery Value

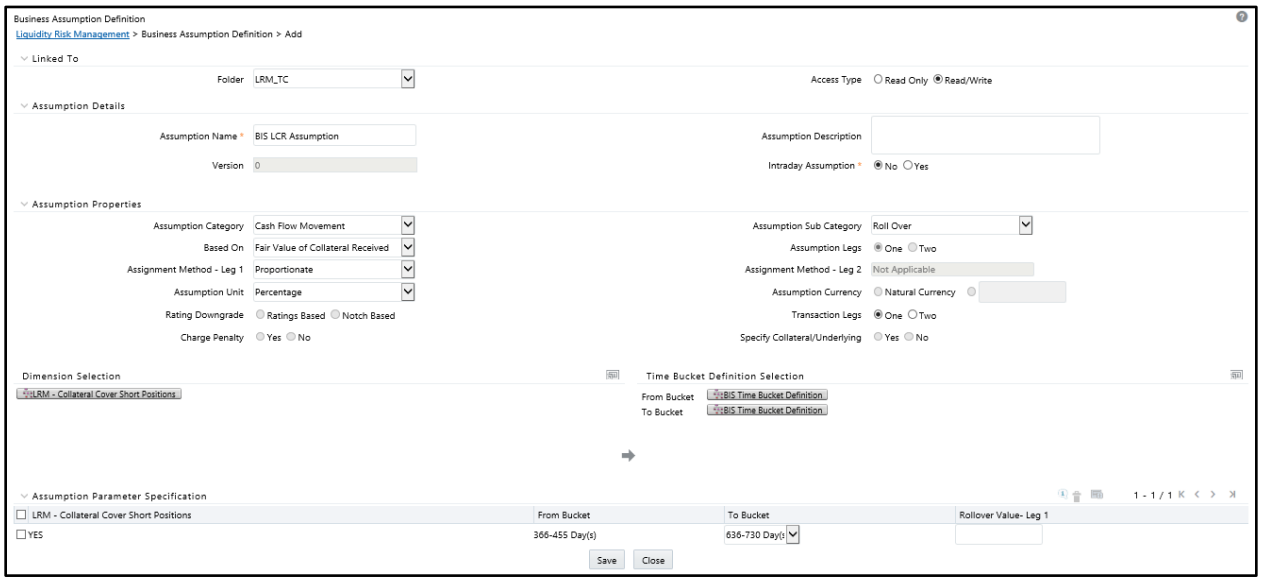
    The unique combinations of selected dimension members and the from buckets are displayed as rows.

14. To save the definition, click **Save**.

**NOTE:** Refer section Recovery for detailed explanation and calculations.

### 6.9.1.7 Rollover

When the assumption sub-category is selected as Roll Over, perform the following steps:



1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
    - Cash Flows
    - Fair Value of Collateral Posted
    - Fair Value of Collateral Received
    - Market Value of Collateral Posted
    - Market Value of Collateral Received
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Roll Over. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. Select the **Assignment Method – Leg 1** from the drop-down list:
    - Selected Time Bucket
    - Increasing
    - Decreasing
    - Equal
    - Proportionate
4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

    **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. Choose the **Transaction Leg** option that is, One or Two.
    - If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for From and To assumption value specification.
    - If Two is selected, two columns are displayed for the specification of each assumption leg that is two columns each for From and To assumption value specification. The products for which two transaction legs are applicable are collateral swaps, inter-state swaps and similar products.
7. In **Dimension Selection**, perform the following steps:
    a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
    c. Click  to move the selected members to Selected Members section, or click  to select all members.
    d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
    e. Click the selected dimension member. The Hierarchy Browser window is displayed.

f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click > to move the selected members to Selected Members section, or click >> to select all members.

g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

8. In **Time Bucket Definition Selection**, perform the following steps:

a. Click icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.

c. Click **OK**. The selected time bucket definition, is displayed in the time bucket definition selection against both **From Bucket** selection, and **To Bucket** selection.

d. For **From Bucket**, click the selected time bucket icon.

One or multiple time buckets from the given time bucket definition can be selected as part of From Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

e. For **To Bucket**, click the selected time bucket icon.

One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of To Bucket selection. The time buckets selected are displayed as drop-down values in the To Bucket column in each row of the assumption specification table.

9. After the assumption parameters are selected, click icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

The Assumption Parameter Specification table has the following columns:

- Each selected dimension
- From Bucket
- To Bucket
- Rollover Value – Leg 1 (if Transaction Legs is One)
- Rollover Value – Leg 2 (if Transaction Legs is Two)

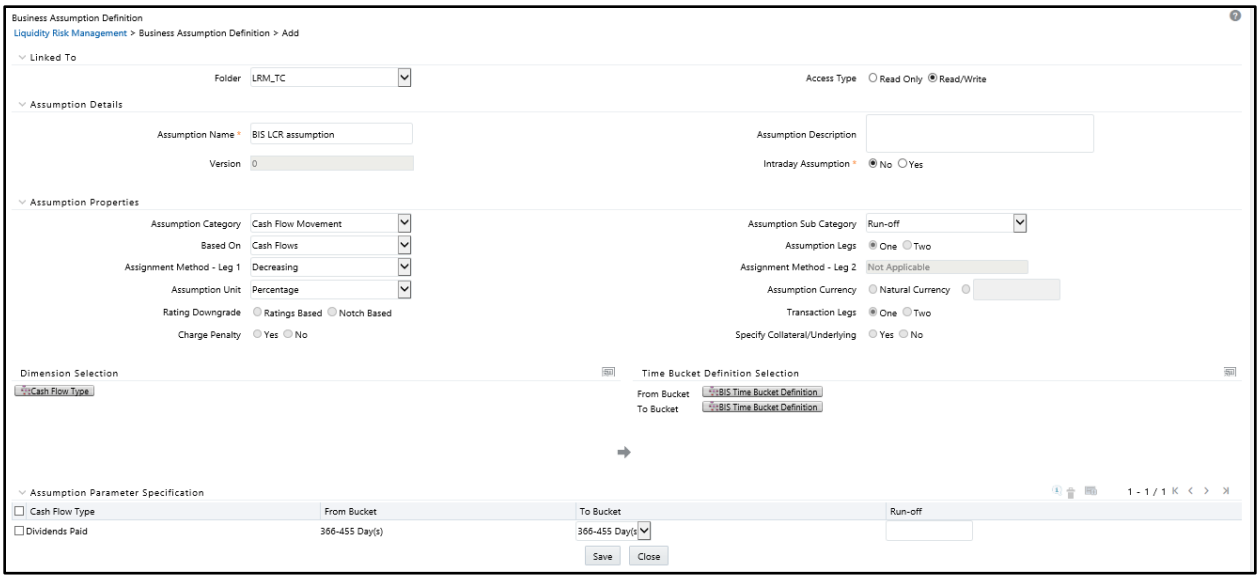
The unique combinations of selected dimension members and the from buckets are displayed as rows.

10. To save the definition, click **Save**.

**NOTE:** Refer section Rollover for detailed explanation and calculations.

### 6.9.1.8 Run-Off

When the assumption sub-category is selected as Run-Off, perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
    - Cash Flows
    - EOP Balance
    - High Run-off Category 1 Balance
    - High Run-off Category 2 Balance
    - High Run-off Category 3 Balance
    - Highly Stable Balance
    - Insured Balance
    - Less Stable Balance
    - Stable Balance
    - Uninsured Balance
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Run-Off. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. Select the **Assignment Method – Leg 1** from the drop-down list:
    - Selected Time Bucket
    - Increasing
    - Decreasing
    - Equal
    - Proportionate

4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

   **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
7. In **Dimension Selection**, perform the following steps:
   a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
   b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
   c. Click to move the selected members to Selected Members section, or click to select all members.
   d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
   e. Click the selected dimension member. The Hierarchy Browser window is displayed.
   f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click to move the selected members to Selected Members section, or click to select all members.
   g. Click **OK**.

      **Note**:

      - In the dimension panel, you can add only seven dimensions.
      - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.
8. In **Time Bucket Definition Selection**, perform the following steps:
   a. Click icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.
   b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket can be selected. The values which are defined in the time bucket definition window are displayed here.
   c. Click **OK**. The selected time bucket definition is displayed in the time bucket definition selection against both **From Bucket** selection, and **To Bucket** selection.
   d. For **From Bucket**, click the selected time bucket icon.

      One or multiple time buckets from the given time bucket definition can be selected as part of From Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

e. For **To Bucket**, click the selected time bucket icon.

One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of To Bucket selection. The time buckets selected are displayed as drop-down values in the To Bucket column in each row of the assumption specification table.

9. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. . The **Assumption Parameter Specification** table is displayed.

   The Assumption Parameter Specification table has the following columns:

   - Each selected dimension
   - From Bucket
   - To Bucket
   - Run-Off

   The unique combinations of selected dimension members and the from buckets are displayed as rows.

10. To save the definition, click **Save**.

**NOTE:** Refer section Run Off for detailed explanation and calculations.

### 6.9.2 Encumbrance

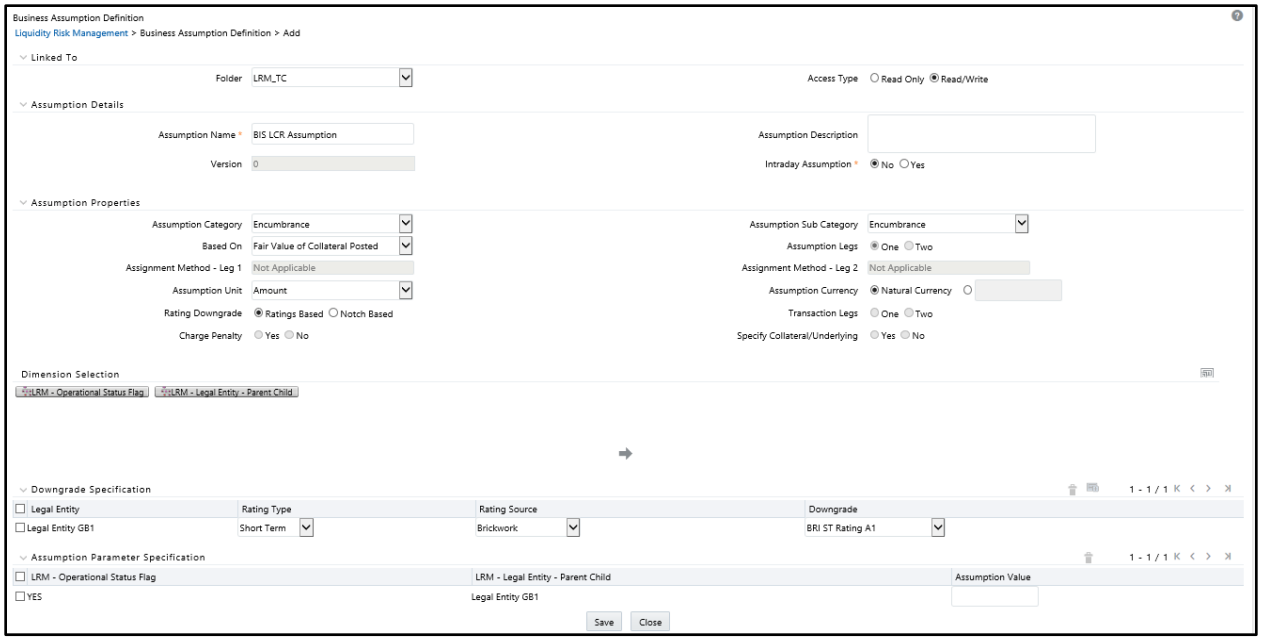
In Assumption Parameters, when you select the Assumption Category as **Encumbrance** from the drop-down list the following sub-categories are available for selection:

- Encumbrance
- Ratings Downgrade
- Valuation Changes

**NOTE:** Depending upon the assumption category and sub-categories selected, assumption parameters are defined.

#### 6.9.2.1 Encumbrance

When the assumption sub-category is selected as Encumbrance, perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
    - Downgrade Impact Value
    - Fair Value
    - Fair Value of Collateral Posted
    - Fair Value of Collateral Received
    - Fair Value of Excess Collateral
    - Fair Value of Required Collateral
    - Largest 30 Day Cumulative Collateral Amount
    - Market Value
    - Market Value of Collateral Posted
    - Market Value of Collateral Received
    - Market Value of Excess Collateral
    - Market Value of Required Collateral
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Encumbrance. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
4. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

**Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.

5. Choose the **Ratings Downgrade** option. That is, **Rating Based** or **Notches Based**. This parameter identifies the downgrade specified for a legal entity.
6. In **Dimension Selection**, perform the following steps:
    a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
    c. Click  to move the selected members to Selected Members section, or click  to select all members.
    d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
    e. Click the selected dimension member. The Hierarchy Browser window is displayed.
    f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.
    g. Click **OK**.

    **Note**:

    - In the dimension panel, you can add only seven dimensions.
    - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

7. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. The **Downgrade Specification** and **Assumption Parameter Specification** table is displayed.

    The Downgrade Specification table has the following columns:

    - Each selected dimension
    - Rating Type
    - Rating Source
    - Downgrade

    The Assumption Parameter Specification table has the following columns:

    - Each selected dimension
    - Assumption Value

    The unique combinations of selected dimension members and the from buckets are displayed as rows.
8. To save the definition, click **Save**.

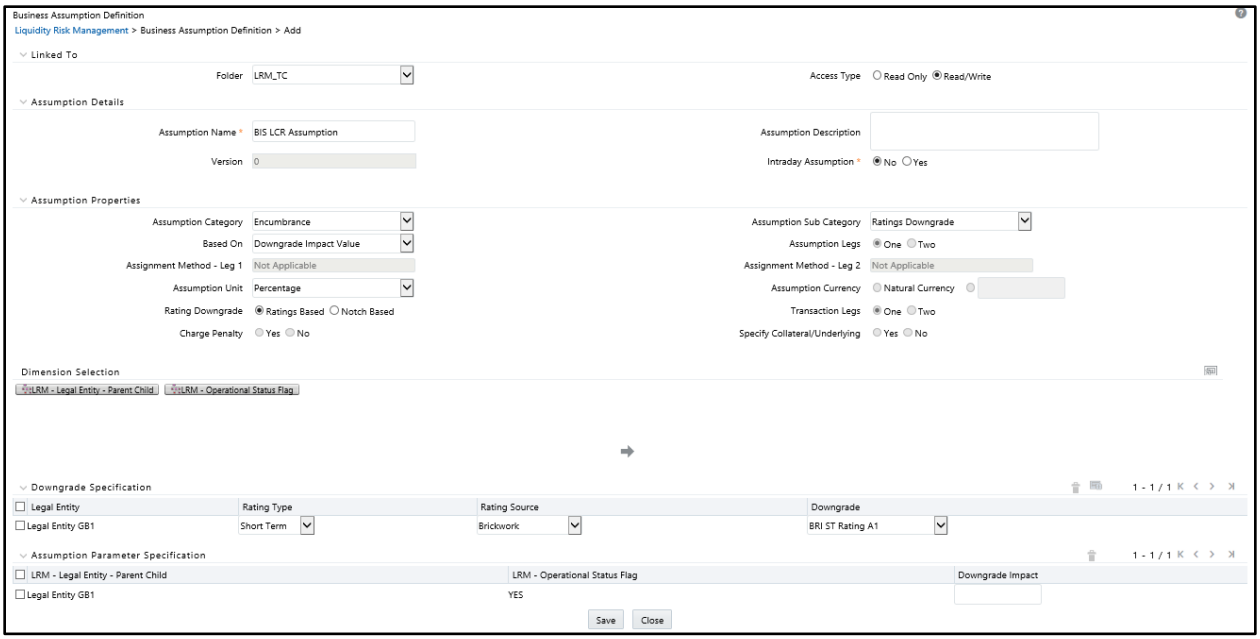
**NOTE:**

The time bucket selection is not required as they are not determined and these factors are applied to balances and market values of assets and liabilities.

Refer section Encumbrance for detailed explanation and calculations.

### 6.9.2.2 Ratings Downgrade

When the assumption sub-category is selected as Ratings Downgrade perform the following steps:




1. From the **Based On** drop-down list, the parameter available for selection is **Downgrade Impact Value** which is applied on different assumption values.
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Encumbrance. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
4. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

   **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
5. Choose the **Ratings Downgrade** option. That is, **Rating Based** or **Notches Based**. This parameter identifies the downgrade specified for a legal entity.
6. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.

7. In **Dimension Selection**, perform the following steps:
    a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
    c. Click  to move the selected members to Selected Members section, or click  to select all members.
    d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
    e. Click the selected dimension member. The Hierarchy Browser window is displayed.
    f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.
    g. Click **OK**.

    **Note**:

    - In the dimension panel, you can add only seven dimensions.
    - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

8. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. The **Downgrade Specification** and **Assumption Parameter Specification** table is displayed.

    The Downgrade Specification table has the following columns:

    - Each selected dimension
    - Rating Type
    - Rating Source
    - Downgrade

    The Assumption Parameter Specification table has the following columns:

    - Each selected dimension
    - Downgrade Impact

    The unique combinations of selected dimension members and the from buckets are displayed as rows.

9. To save the definition, click **Save**.

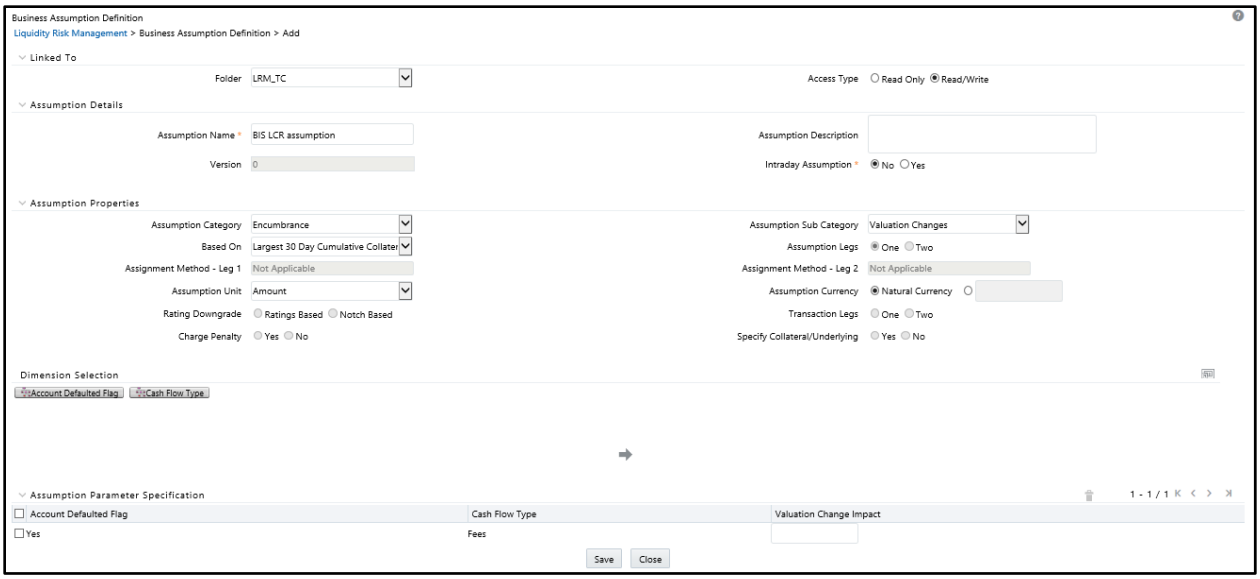
**NOTE:**

The time bucket selection is not required as they are not determined and these factors are applied to balances and market values of assets and liabilities.

Refer section Ratings Downgrade for detailed explanation and calculations.

### 6.9.2.3 Valuation Changes

When the assumption sub-category is selected as Valuation Changes perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
    - Fair Value
    - Fair Value of Collateral Posted
    - Fair Value of Collateral Received
    - Fair Value of Excess Collateral
    - Fair Value of Required Collateral
    - Largest 30 Day Cumulative Collateral Amount
    - Market Value
    - Market Value of Collateral Posted
    - Market Value of Collateral Received
    - Market Value of Excess Collateral
    - Market Value of Required Collateral
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Encumbrance. When one is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.

4. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

   **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.

5. In **Dimension Selection**, perform the following steps:
   a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
   b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
   c. Click to move the selected members to Selected Members section, or click to select all members.
   d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
   e. Click the selected dimension member. The Hierarchy Browser window is displayed.
   f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click to move the selected members to Selected Members section, or click to select all members.
   g. Click **OK**.

      **Note**:
      - In the dimension panel, you can add only seven dimensions.
      - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

6. After the assumption parameters are selected, click icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

   The Assumption Parameter Specification table has the following columns:
   - Each selected dimension
   - Valuation Change Impact

   The unique combinations of selected dimension members and the from buckets are displayed as rows.

7. To save the definition, click **Save**.

**NOTE:**

The time bucket selection is not required as they are not determined and these factors are applied to balances and market values of assets and liabilities.

Refer section Valuation Changes for detailed explanation and calculations.

## 6.9.3 Incremental Cash Flow

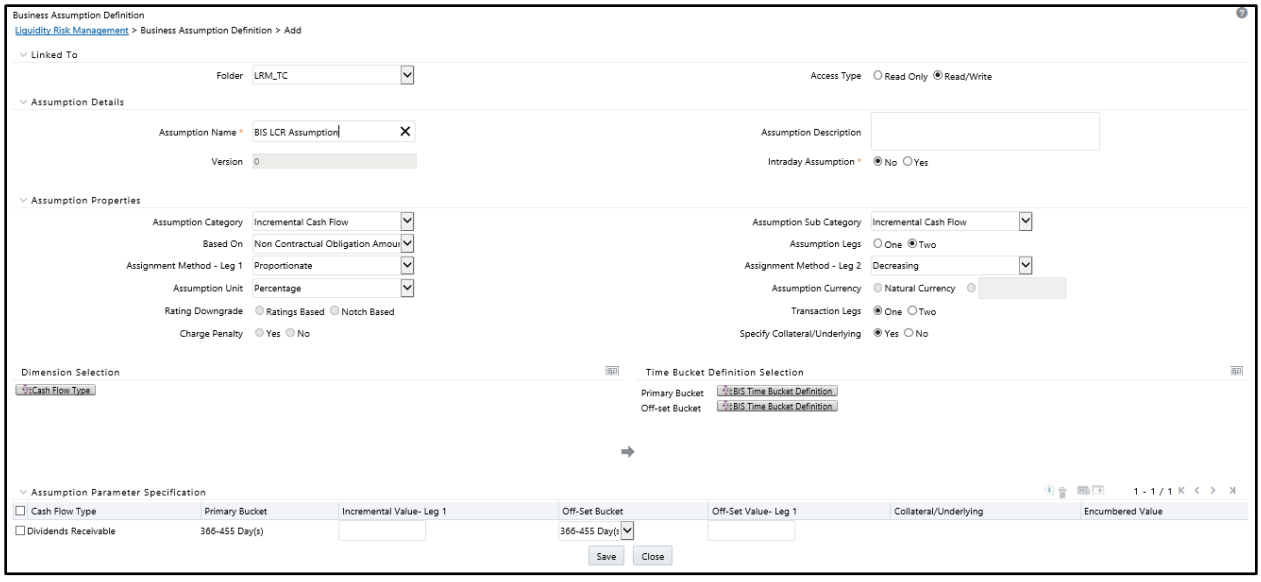
In Assumption Parameters, when you select the Assumption Category as **Incremental Cash Flow** from the drop-down list the following sub-categories are available for selection:

- Incremental Cash Flow
- Drawdown
- Liability Run-Off
- New Business
- Ratings Downgrade
- Run-Off
- Secured Funding/Financing
- Valuation Changes

**NOTE:** Depending upon the assumption category and sub-categories selected, assumption parameters are defined.

### 6.9.3.1 Incremental Cash Flow

When the assumption sub-category is selected as Incremental Cash Flow perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
   - Available Undrawn Amount
   - Cash Flows

- Downgrade Impact Value
- EOP Balance
- Fair Value
- Fair Value of Collateral Posted
- Fair Value of Collateral Received
- Fair Value of Excess Collateral
- Fair Value of Required Collateral
- General Ledger Balance
- High Run-off Category 1 Balance
- High Run-off Category 2 Balance
- High Run-off Category 3 Balance
- Highly Stable Balance
- Insured Balance
- Largest 30 Day Cumulative Collateral Amount
- Less Stable Balance
- Market Value
- Market Value of Collateral Posted
- Market Value of Collateral Received
- Market Value of Excess Collateral
- Market Value of Required Collateral
- Non-Contractual Obligation Amount
- Non Operational Balance
- Penalty Free Portion of Stable Balance
- Penalty Free Portion of Highly Stable Balance
- Stable Balance
- Undrawn Balance
- Uninsured Balance

2. Choose the **Assumption Legs** option that is, **One** or **Two**.
    - In case, One is selected as assumption leg, then only column appears for entering the off-set assumption value.

- In case, Two is selected as the assumption leg, then two columns appear for entering primary assumption value and secondary or off-set value.

3. Select the **Assignment Method – Leg 1** and **Assignment Method – Leg 2** from the drop-down list:
    - Selected Time Bucket
    - Increasing
    - Decreasing
    - Equal
    - Proportionate
4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

    **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. In case you have selected Assumption Legs as Two, choose the **Transaction Leg** option that is, One or Two.
    - If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for From and To assumption value specification.
    - If Two is selected, two columns are displayed for the specification of each assumption leg that is two columns each for From and To assumption value specification. The products for which two transaction legs are applicable are collateral swaps, inter-state swaps and similar products.
7. In case you have selected Assumption Legs as Two, choose the **Specify Collateral/Underlying** option that is, Yes or No.
    - If Yes is selected, existing assets can be posted as collateral for each row in the assumption specification table.
    - If No is selected, no collateral is required.
8. In **Dimension Selection**, perform the following steps:
    a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
    c. Click  to move the selected members to Selected Members section, or click  to select all members.
    d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
    e. Click the selected dimension member. The Hierarchy Browser window is displayed.

f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.

g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

9. In **Time Bucket Definition Selection**, perform the following steps:

a. Click  icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.

c. Click **OK**. The selected time bucket definition, is displayed in the time bucket definition selection against both **Primary Bucket** selection, and **Off-set Bucket** selection.

d. For **Primary Bucket**, click the selcted time bucket icon.

One or multiple time buckets from the given time bucket definition can be selected as part of Primary Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

e. For **Off-set Bucket**, click the selcted time bucket icon.

One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of Off-set Bucket selection. The time buckets selected are displayed as drop-down values in the Off-set Bucket column in each row of the assumption specification table.

**Note**: If you have selected Assumptions Legs as One, in Time Bucket Definition Selection only Off-set Bucket is displayed. Whereas, if you have selected Assumptions Legs as Two, in Time Bucket Definition Selection both Primary Bucket and Off-set Bucket is displayed.

10. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

The Assumption Parameter Specification table has the following columns:

- Each selected dimension
- Primary Bucket (if Assumption Legs is Two)
- Incremental Value – Leg 1 (if Transaction Legs is One)
- Incremental Value – Leg 2 (if Transaction Legs is Two)
- Off-set Bucket
- Off-set Value – Leg 1 (if Transaction Legs is One)

- Off-set Value – Leg 2 (if Transaction Legs is Two)
- Collateral/Underlying (if Specify Collateral/Underlying is yes)
- Encumbered Value (if Specify Collateral/Underlying is yes)

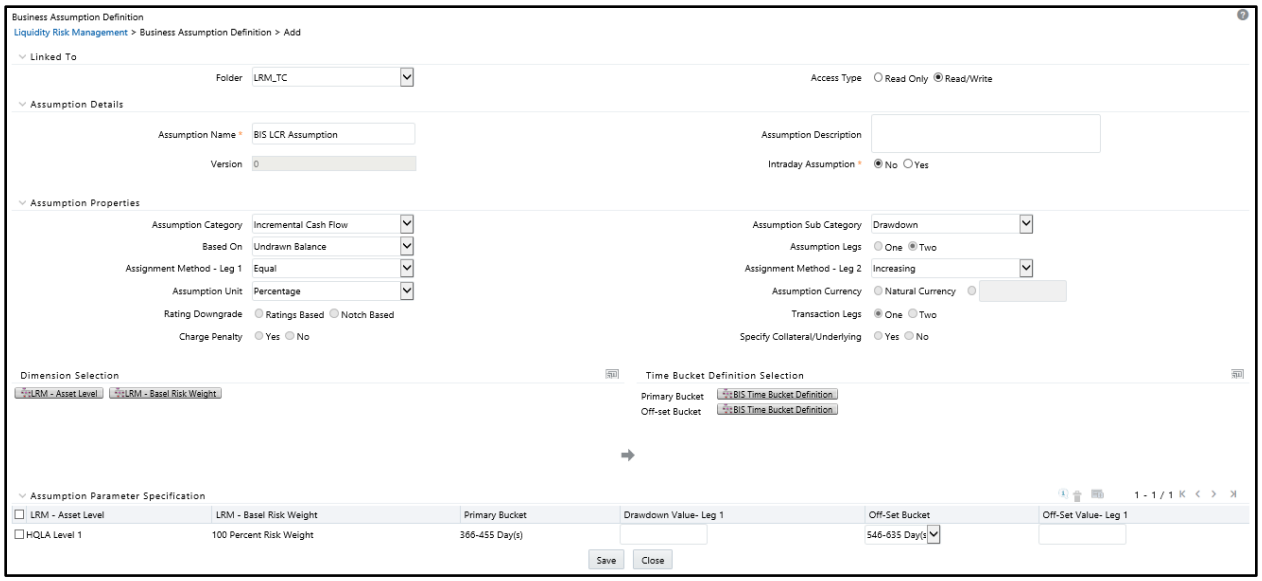
The unique combinations of selected dimension members and the from buckets are displayed as rows.

11. To save the definition, click **Save**.

**NOTE:** Refer section Incremental Cash Flow for detailed explanation and calculations.

### 6.9.3.2 Drawdown

When the assumption sub-category is selected as Drawdown, perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
   - Adjusted Undrawn Amount
   - Available Undrawn Amount
   - Portion of the undrawn amount that can be drawn in liquidity horizon period
   - Structured Outflow Amount
   - Undrawn Balance
2. In **Assumption Legs** option, **Two** is selected by default. Option One is disabled when you select the sub-category as Drawdown. When Two is selected as assumption leg, in assumption specification two columns are displayed to add the primary assumption value.
3. Select the **Assignment Method – Leg 1** and **Assignment Method – Leg 2** from the drop-down list:
   - Selected Time Bucket

- Increasing
- Decreasing
- Equal
- Proportionate

4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

   **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
7. In **Dimension Selection**, perform the following steps:
   a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
   b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
   c. Click to move the selected members to Selected Members section, or click to select all members.
   d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
   e. Click the selected dimension member. The Hierarchy Browser window is displayed.
   f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click to move the selected members to Selected Members section, or click to select all members.
   g. Click **OK**.

      **Note**:

      - In the dimension panel, you can add only seven dimensions.
      - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.
8. In **Time Bucket Definition Selection**, perform the following steps:
   a. Click icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.
   b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.
   c. Click to move the selected members to Selected Members section, or click to select all members.

d. Click **OK**. The selected time bucket definition is displayed in the time bucket definition selection against both **Primary Bucket** selection, and **Off-set Bucket** selection.

e. For **Primary Bucket**, click the selected time bucket icon.

One or multiple time buckets from the given time bucket definition can be selected as part of Primary Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

f. For **Off-set Bucket**, click the selected time bucket icon.

One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of Off-set Bucket selection. The time buckets selected are displayed as drop-down values in the Off-set Bucket column in each row of the assumption specification table.

9. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

   The Assumption Parameter Specification table has the following columns:

   - Each selected dimension
   - Primary Bucket
   - Downgrade Value – Leg 1
   - Off-set Bucket
   - Off-set Value – Leg 1

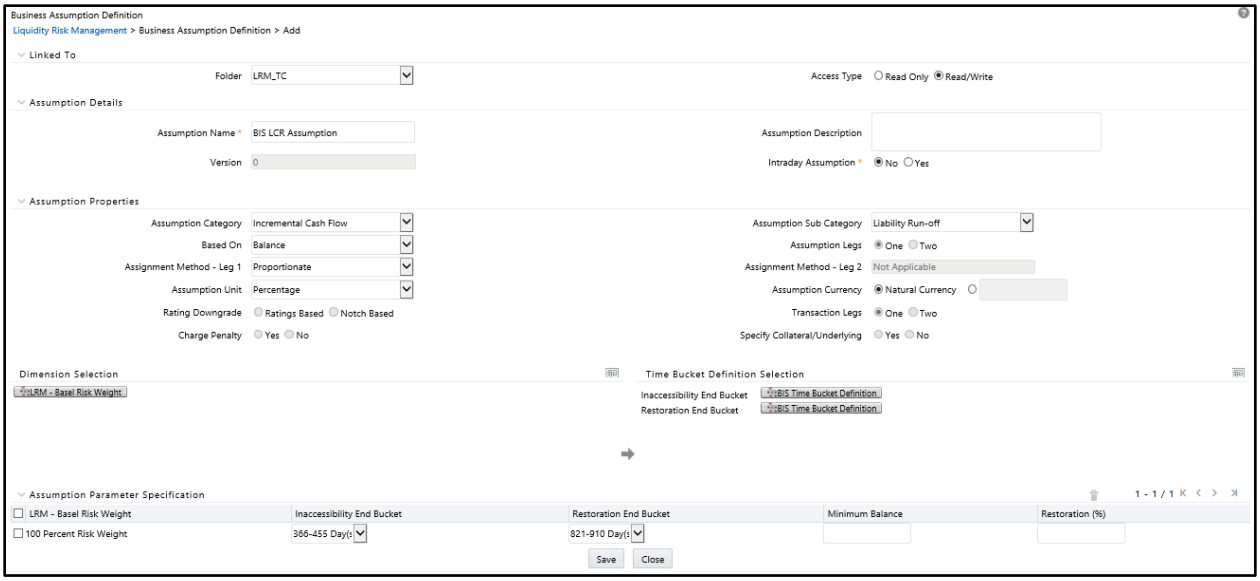
   The unique combinations of selected dimension members and the from buckets are displayed as rows.

10. To save the definition, click **Save**.

**NOTE:** Refer section Drawdown for detailed explanation and calculations.

#### 6.9.3.3 Liability Run-off

When the assumption sub-category is selected as Liability Run-off perform the following steps:




1. From the **Based On** drop-down list, the parameter available for selection is **Balance** which is applied on different assumption values.
2. In Assumption Legs option, **One** is selected by default. Option Two is disabled when you select the sub-category as Liability Run-off. When one is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. From the **Assignment Method – Leg 1** drop-down list, the parameter available for selection is **Proportionate** which is applied on different assumption values.
4. From the **Assumption Unit** drop-down list, the parameter available for selection is **Percentage** which is required for specifying the Restoration percentage.
5. Choose the **Assumption Currency** option. This is required to specify the minimum Balance.

   **Note**: This is the only assumption where a currency is specified even when the unit is specified as percentage. The assumption currency is required for specifying the minimum Balance.
6. In **Transaction Leg**, option One is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
7. In **Dimension Selection**, perform the following steps:
   a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
   b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
   c. Click to move the selected members to Selected Members section, or click to select all members.
   d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
   e. Click the selected dimension member. The Hierarchy Browser window is displayed.

f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.

g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

8. In **Time Bucket Definition Selection**, perform the following steps:

a. Click  icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.

c. Click **OK**. The selected time bucket definition is displayed in the time bucket definition selection against both **Inaccessibility End Bucket** selection, and **Restoration End Bucket** selection.

d. For **Inaccessibility End Bucket**, click the selected time bucket icon.

One or multiple time buckets from the given time bucket definition can be selected as part of Inaccessibility End Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

e. For **Restoration End Bucket**, click the selected time bucket icon.

A single selection of a time bucket greater than the Inaccessibility End Bucket can be selected as part of Restoration End Bucket selection. The time buckets selected are displayed as drop-down values in the Off-set Bucket column in each row of the assumption specification table.

9. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

The Assumption Parameter Specification table has the following columns:

- Each selected dimension
- Inaccessibility End Bucket:

  This is a single selection from a list of time buckets selected as part of the Inaccessibility End Bucket parameter in the Time Bucket Definition Selection section. The last day of the Inaccessibility End Bucket is the end of the market inaccessibility period. Day 1 is the start of the inaccessibility period. If no time bucket is selected, then market inaccessibility period is 0.
- Restoration End Bucket:

This is a single selection from a list of time buckets selected as part of the Restoration End Bucket parameter in the Time Bucket Definition Selection section. This time bucket is greater than the Inaccessibility End Bucket. The last day of the Restoration End Bucket is the end of the restoration period. Inaccessibility End Day+1 is the start of the restoration period.

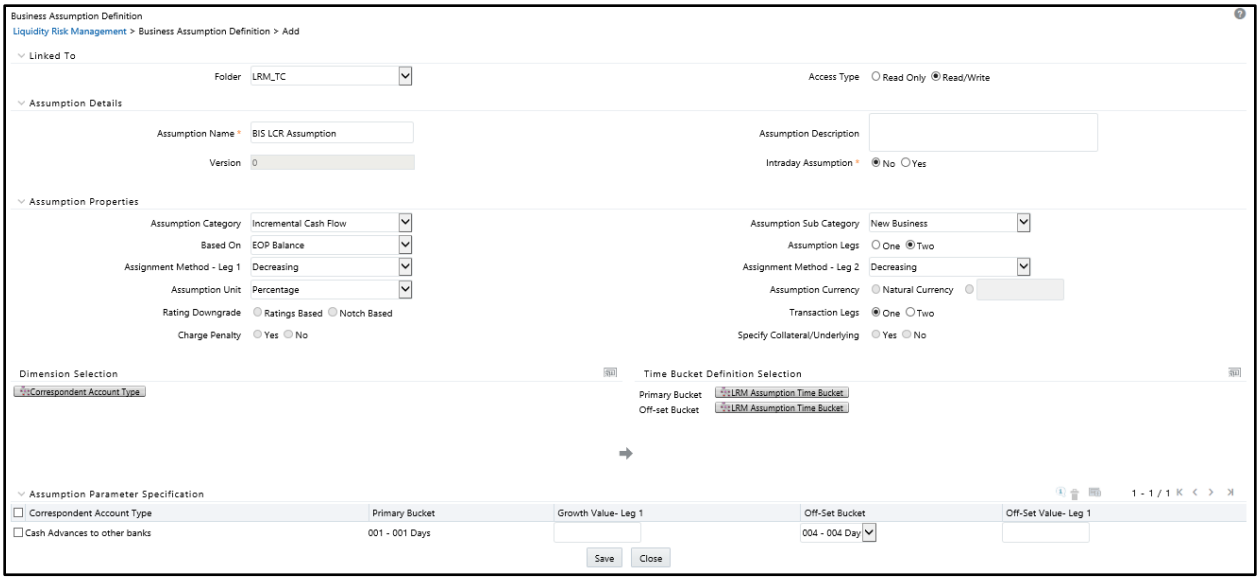
- The minimum Balance is specified as an amount (in terms of the assumption currency).
- The Restoration percentage is specified as a percentage.

10. To save the definition, click **Save**.

**NOTE:** Refer section Liability Run-Off for detailed explanation and calculations.

#### 6.9.3.4 New Business

When the assumption sub-category is selected as New Business perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
   - EOP Balance
2. **Choose the Assumption Legs option** that is, **One** or **Two**.
   - In case, One is selected as assumption leg, then only column appears for entering the off-set assumption value.

     **Note**:

     In the Time Bucket Definition Selection, only primary bucket is displayed and can be selected**.** The Off-set buckets are not displayed.

In the Assumption Parameter Specification Section, you can select Growth Value – Leg 1 and Off-set Value – Leg 1 is not displayed.

- In case, Two is selected as the assumption leg, then in assumption specification two columns are displayed to add the primary assumption value.

3. Select the **Assignment Method – Leg 1** and **Assignment Method – Leg 2** from the drop-down list:
    - Selected Time Bucket
    - Increasing
    - Decreasing
    - Equal
    - Proportionate
4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

    **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. Choose the **Transaction Leg** option that is, One or Two.
    - If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for From and To assumption value specification.
    - If Two is selected, two columns are displayed for the specification of each assumption leg that is two columns each for From and To assumption value specification. The products for which two transaction legs are applicable are collateral swaps, inter-state swaps and similar products.
7. In **Dimension Selection**, perform the following steps:
    a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
    c. Click  to move the selected members to Selected Members section, or click  to select all members.
    d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
    e. Click the selected dimension member. The Hierarchy Browser window is displayed.
    f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.
    g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

8. In **Time Bucket Definition Selection**, perform the following steps:
   a. Click icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.
   b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.
   c. Click **OK**. The selected time bucket definition, is displayed in the time bucket definition selection against **Time Bucket** selection.
   d. For **Time Bucket**, click the selected time bucket icon.

      One or multiple time buckets from the given time bucket definition can be selected as part of Time Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.
9. After the assumption parameters are selected, click icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

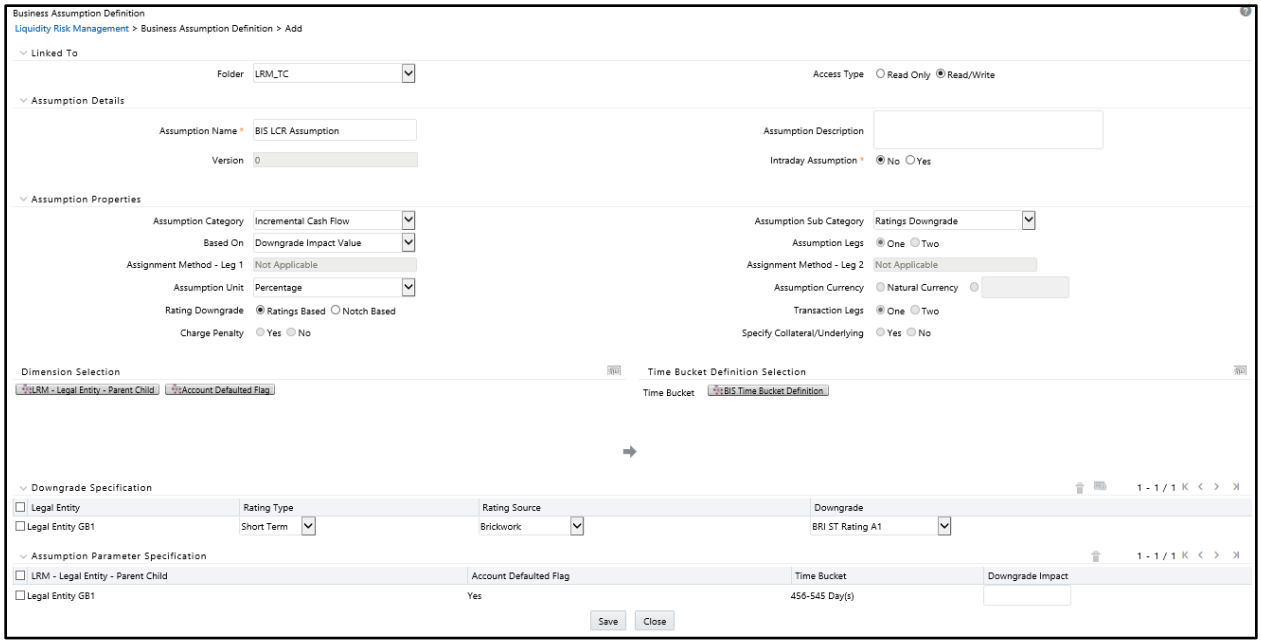
   The Assumption Parameter Specification table has the following columns:
   - Each selected dimension
   - Primary Bucket
   - Growth Value – Leg 1 (if Transaction Legs is 1)
   - Growth Value – Leg 2 (if Transaction Legs is 2)
   - Off-set Bucket
   - Off-set Value – Leg 1 (if Transaction Legs is 1)
   - Off-set Value – Leg 2 (if Transaction Legs is 2)

   The unique combinations of selected dimension members and the from buckets are displayed as rows.
10. To save the definition, click **Save**.

**NOTE:** Refer section New Business for detailed explanation and calculations.

#### 6.9.3.5 Ratings Downgrade

When the assumption sub-category is selected as Ratings Downgrade perform the following steps:




1. From the **Based On** drop-down list, the parameters available for selection are **Downgrade Impact Value,** and **Underlying Mitigant Value** which is applied on different assumption values.
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Ratings Downgrade. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value
3. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
4. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

   **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
5. Choose the **Ratings Downgrade** option. That is, **Rating Based** or **Notche Based**. This parameter identifies the downgrade specified for a legal entity.
6. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
7. In **Dimension Selection**, perform the following steps:
   a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
   b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
   c. Click to move the selected members to Selected Members section, or click to select all members.
   d. Click **OK**. The selected dimensions are displayed in the dimension selection section.

e. Click the selected dimension member. The Hierarchy Browser window is displayed.

f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.

g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

8. In **Time Bucket Definition Selection**, perform the following steps:

a. Click  icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.

c. Click **OK**. The selected time bucket definition is displayed in the time bucket definition selection against **Time Bucket** selection.

d. For **Time Bucket**, click the selected time bucket icon.

One or multiple time buckets from the given time bucket definition can be selected as part of Time Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

9. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. The **Downgrade Specification** and **Assumption Parameter Specification** table is displayed.

The Downgrade Specification table has the following columns:

- Each selected dimension
- Rating Type
- Rating Source
- Downgrade

The Assumption Parameter Specification table has the following columns:

- Each selected dimension
- Time Bucket
- Downgrade Impact

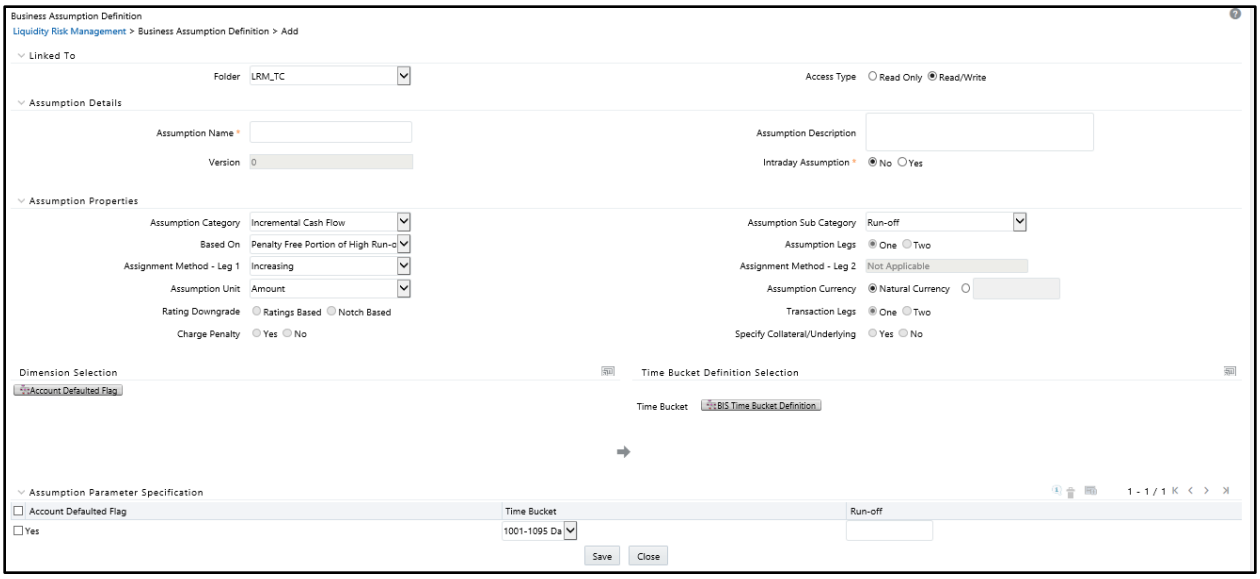
The unique combinations of selected dimension members and the from buckets are displayed as rows.

10. To save the definition, click **Save**.

**NOTE:** Refer section Ratings Downgrade for detailed explanation and calculations.

### 6.9.3.6 Run Off

When the assumption sub-category is selected as Run Off, perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
    - Available Undrawn Amount
    - EOP Balance
    - EOP amount with significant penalty or withdrawal
    - Encumbered Balance
    - Fair Value of Collateral Posted
    - Fair Value of Collateral Received
    - General Ledger Balance
    - High Run-off Category 1 Balance
    - High Run-off Category 2 Balance
    - High Run-off Category 3 Balance
    - Highly Stable Balance
    - Insured Amount Withdrawal without penalty
    - Insured Balance
    - Less Stable Balance
    - Less Stable Balance withdrawable amount without penalty
    - Market Value

- Market Value of Collateral Posted
- Market Value of Collateral Received
- Minimum Amount Due
- Net Derivative Cash Inflow net of collateral
- Non Contractual Obligation Amount
- Non Operational Balance
- Operational Balance
- Penalty Free Portion of High Run-off Category 1 Amount
- Penalty Free Portion of High Run-off Category 2 Amount
- Penalty Free Portion of High Run-off Category 3 Amount
- Penalty Free Portion of Stable Balance
- Returnable Asset Value
- Secured Lending inflow Amount
- Segregated Inflow Amount
- Stable Balance
- Structured Outflow Amount
- Unencumbered Balance
- Unencumbered Stable Amount
- Unencumbered Less Stable Amount
- Uninsured Amount Withdrawal without penalty
- Uninsured Balance
- Uninsured Non Operational Amount
- Uninsured Operational Amount
- Uninsured Operational Amount
- Unsecured Lending Dues

2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Run-Off. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value
3. Select the **Assignment Method – Leg 1** from the drop-down list:
    - Selected Time Bucket
    - Increasing
    - Decreasing

- Equal
- Proportionate

4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

   **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
7. In **Dimension Selection**, perform the following steps:
   a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
   b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
   c. Click to move the selected members to Selected Members section, or click to select all members.
   d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
   e. Click the selected dimension member. The Hierarchy Browser window is displayed.
   f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click to move the selected members to Selected Members section, or click to select all members.
   g. Click **OK**.

      **Note**:

      - In the dimension panel, you can add only seven dimensions.
      - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.
8. In **Time Bucket Definition Selection**, perform the following steps:
   a. Click icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.
   b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.
   c. Click **OK**. The selected time bucket definition, is displayed in the time bucket definition selection against **Time Bucket** selection.
   d. For **Time Bucket**, click the tiem bucket definition icon.

One or multiple time buckets from the given time bucket definition can be selected as part of Time Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

9. After the assumption parameters are selected, click icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

   The Assumption Parameter Specification table has the following columns:

   - Each selected dimension
   - Time Bucket
   - Run-Off

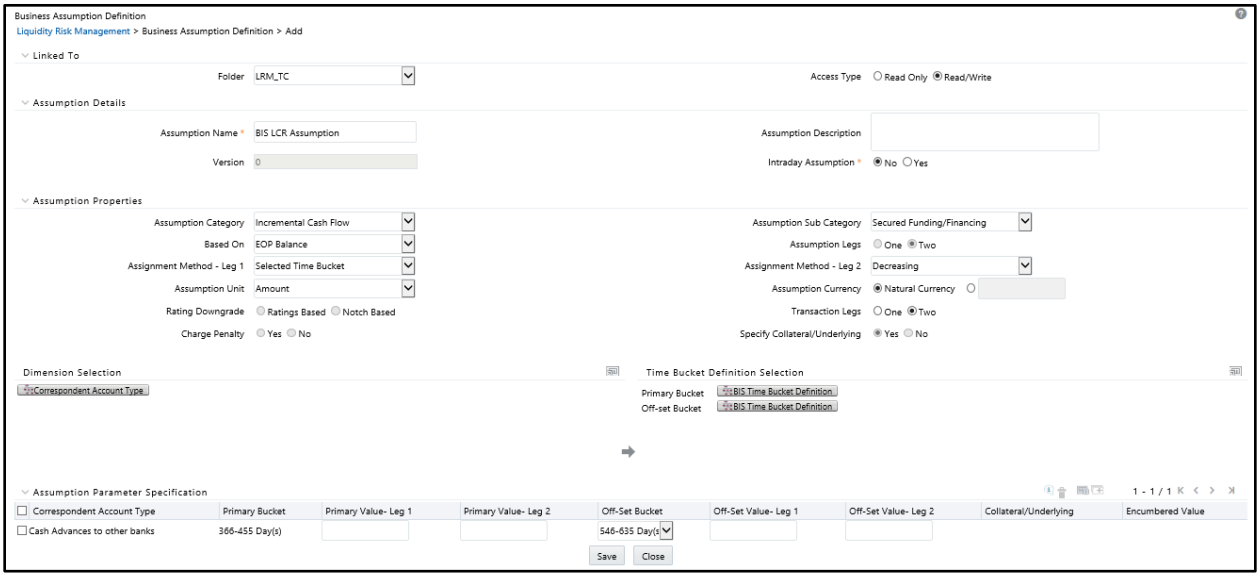
   The unique combinations of selected dimension members and the from buckets are displayed as rows.

10. To save the definition, click **Save**.

**NOTE:** Refer section Run-Off for detailed explanation and calculations.

### 6.9.3.7 Secured Funding/Financing

When the assumption sub-category is selected as Secured Funding/Financing, perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:

   - Cash Flows
   - EOP Balance

2. In **Assumption Legs** option, **Two** is selected by default. Option One is disabled when you select the sub-category as Secured Funding/Financing. When Two is selected as assumption leg, in assumption specification two columns are displayed to add the primary assumption value.

3. Select the **Assignment Method – Leg 1** and **Assignment Method – Leg 2** from the drop-down list:
    - Selected Time Bucket
    - Increasing
    - Decreasing
    - Equal
    - Proportionate
4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

    **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. Choose the **Transaction Leg** option that is, One or Two.
    - If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for From and To assumption value specification.
    - If Two is selected, two columns are displayed for the specification of each assumption leg that is two columns each for From and To assumption value specification. The products for which two transaction legs are applicable are collateral swaps, inter-state swaps and similar products.
7. In case you have selected Assumption Legs as Two, choose the **Specify Collateral/Underlying** option that is, Yes or No.
    - If Yes is selected, existing assets can be posted as collateral for each row in the assumption specification table.
    - If No is selected, no collateral is required.
8. In **Dimension Selection**, perform the following steps:
    a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
    c. Click  to move the selected members to Selected Members section, or click  to select all members.
    d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
    e. Click the selected dimension member. The Hierarchy Browser window is displayed.
    f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.

g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

9. In **Time Bucket Definition Selection**, perform the following steps:
   a. Click icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.
   b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.
   c. Click **OK**. The selected time bucket definition, is displayed in the time bucket definition selection against both **Primary Bucket** selection, and **Off-set Bucket** selection.
   d. For **Primary Bucket**, click the selected time bucket icon.

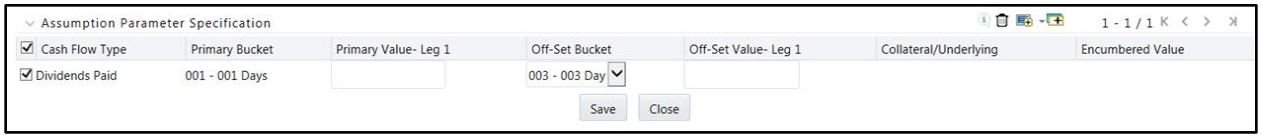
      One or multiple time buckets from the given time bucket definition can be selected as part of Primary Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.
   e. For **Off-set Bucket**, click the selected time bucket icon.
   f. One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of Off-set Bucket selection. The time buckets selected are displayed as drop-down values in the Off-set Bucket column in each row of the assumption specification table.
10. After the assumption parameters are selected, click icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

    The Assumption Parameter Specification table has the following columns:

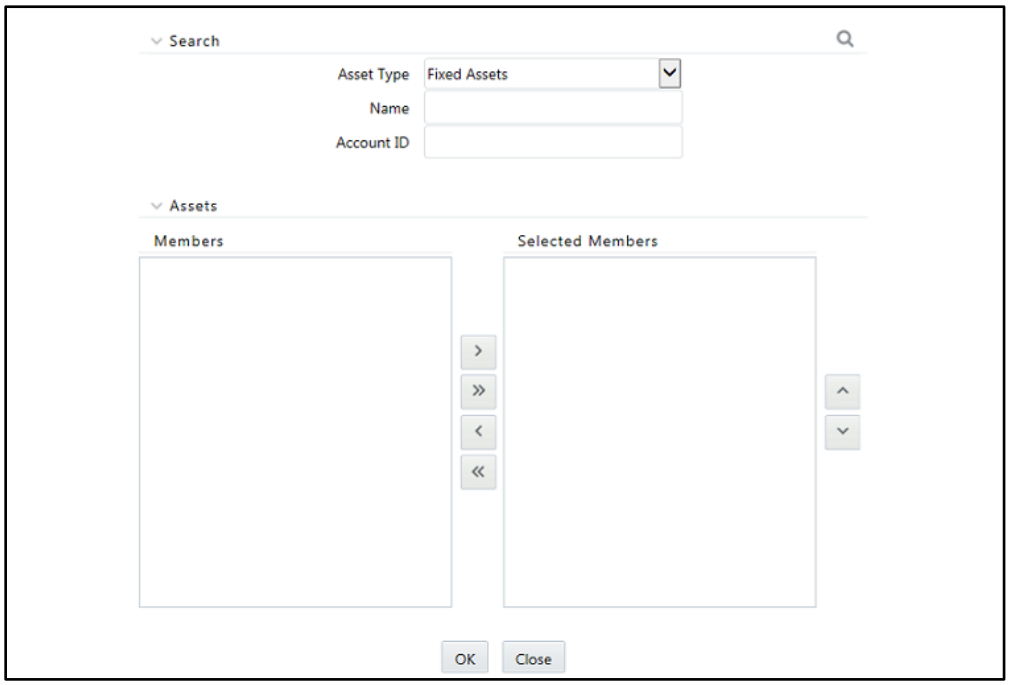
    - Each selected dimension
    - Primary Bucket
    - Primary Value – Leg 1
    - Primary Value – Leg 2 (if Transaction Legs is Two)
    - Off-Set Bucket
    - Off-Set Value – Leg 1
    - Off-Ser Value – Leg 2 (if Transaction Legs is Two)
    - Collateral/Underlying
    - Encumbered Value

    The unique combinations of selected dimension members and the from buckets are displayed as rows.
11. To add values to Collateral/underlying, and Encumbered value columns click the check box on the left of the dimensional combination. Once the dimensional combination is chosen in the grid,

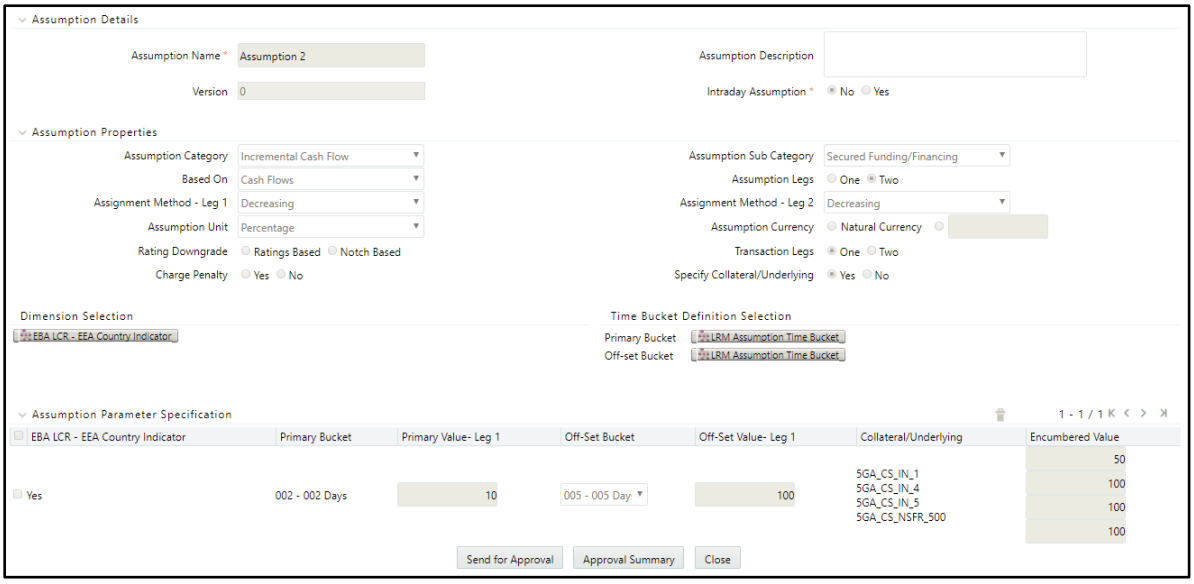
click the Add assets ( ) icon. The add assets icon allows you to add as many assets as needed for the particular row in the grid.




12. Once the Add assets icon is clicked, enter values in the following screen.




13. The business assumption definition after collateral and encumbered value are specified is displayed below.

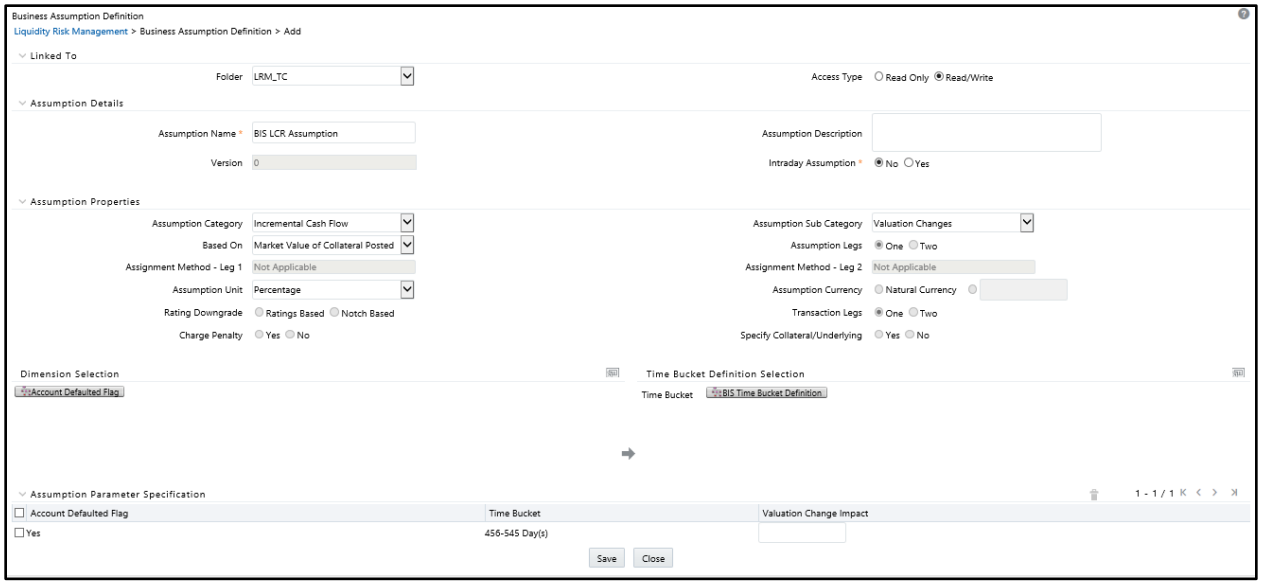


14. To save the definition, click **Save**.

**NOTE:** Refer section Secured Funding/Financing for detailed explanation and calculations.

### 6.9.3.8 Valuation Changes

When the assumption sub-category is selected as Valuation Changes perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
    - Additional Collateral Amount For Derivatives
    - Collateral Valuation Change Amount
    - Contractually Due Collateral
    - Dividend Payable
    - Excess Collateral Due
    - Excess Contractual Obligation Amount
    - Fair Value
    - Fair Value of Collateral Posted
    - Fair Value of Collateral Received
    - Fair Value of Excess Collateral
    - Fair Value of Required Collateral
    - Largest 30 Day Cumulative Collateral Amount
    - Market Value

- Market Value of Collateral Posted
- Market Value of Collateral Received
- Market Value of Excess Collateral
- Market Value of Required Collateral
- Net Derivative Cash Outflow net of collateral

2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Valuation Changes. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value
3. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
4. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

   **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
5. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
6. In **Dimension Selection**, perform the following steps:
   a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
   b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
   c. Click  to move the selected members to Selected Members section, or click  to select all members.
   d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
   e. Click the selected dimension member. The Hierarchy Browser window is displayed.
   f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.
   g. Click **OK**.

      **Note**:
      - In the dimension panel, you can add only seven dimensions.
      - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.
7. In **Time Bucket Definition Selection**, perform the following steps:
   a. Click  icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.

c. Click **OK**. The selected time bucket definition is displayed in the time bucket definition selection against **Time Bucket** selection.

d. For **Time Bucket**, click the selected time bucket icon.

One or multiple time buckets from the given time bucket definition can be selected as part of Time Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

8. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

   The Assumption Parameter Specification table has the following columns:

   - Each selected dimension
   - Time Bucket
   - Downgrade Impact

   The unique combinations of selected dimension members and the from buckets are displayed as rows.

9. To save the definition, click **Save**.

**NOTE:** Refer section Valuation Changes for detailed explanation and calculations.

### 6.9.4 Value Change

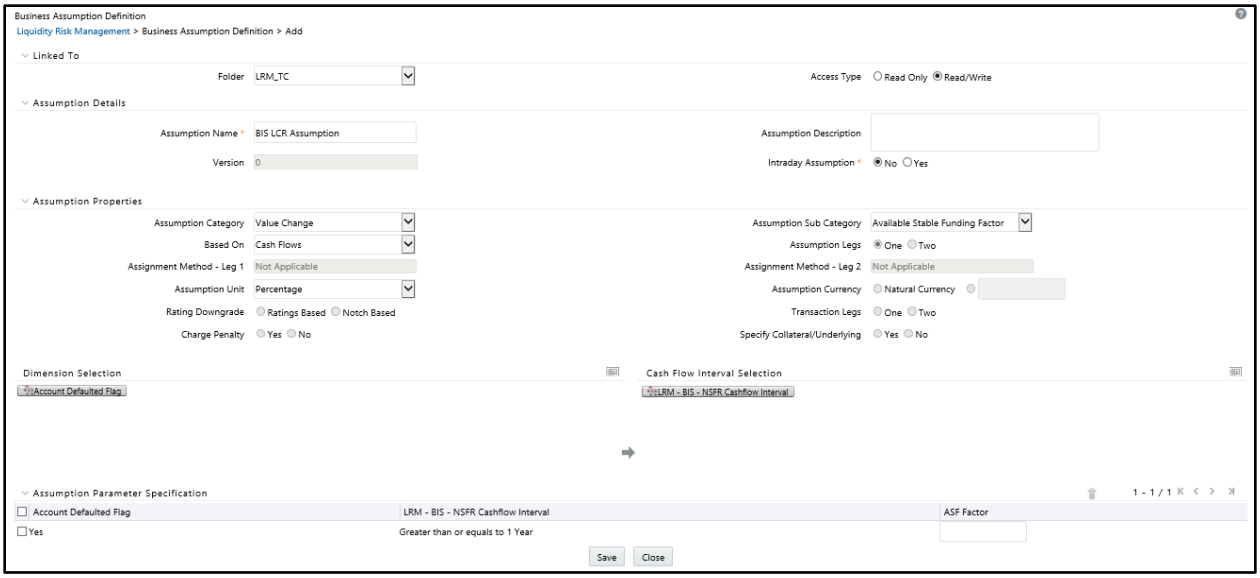
In Assumption Parameters, when you select the Assumption Category as **Value Change** from the drop-down list the following sub-categories are available for selection:

- Available Stable Funding Factor
- Haircut
- Required Stable Funding Factor

**NOTE:** Depending upon the assumption category and sub-categories selected, assumption parameters are defined.

#### 6.9.4.1 Available Stable Funding Factor

When the assumption sub-category is selected as Available Stable Funding Factor, perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
    - Cash Flows
    - EOP Balance
    - Less Stable Balance
    - NSFR Derivative Liabilities
    - Net NSFR Derivative Liabilities
    - Non-Operational Balance
    - Non-Operational Cash Flows
    - Operational Balance
    - Operational Cash Flows
    - Stable Balance
    - Standard Accounting Head Balance
    - Total Less Stable Balance
    - Total Less Stable Cash Flows
    - Total Stable Balance
    - Total Stable Cash Flows
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Available Stable Funding Factor. When one is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. In **Assumption Unit** option, Percentage is selected by default.

4. In **Dimension Selection**, perform the following steps:
    a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
    c. Click to move the selected members to Selected Members section, or click to select all members.
    d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
    e. Click the selected dimension member. The Hierarchy Browser window is displayed.
    f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click to move the selected members to Selected Members section, or click to select all members.
    g. Click **OK**.

    **Note**:
    - In the dimension panel, you can add only seven dimensions.
    - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

5. In **Cash Flow Interval Selection**, perform the following steps:
    a. Click icon for **Cash Flow Interval Selection**. The Cash Flow Interval Selection browser window is displayed.
    b. Select a defined Cash flow interval as displayed in the browser.
    c. Click **OK**. The selected Cash Flow Interval is displayed in the Cash Flow Interval selection section.
    d. Click the selected dimension member. The Hierarchy Browser window is displayed.
    e. Select one or multiple members from a list of dimension members displayed in the Hierarchy browser. Click to move the selected members to Selected Members section, or click to select all members
    f. Click **OK**.

    **Note**:
    - This selection is enabled only when you select Based On measure as Cash Flows, Less Stable Cash Flows, Non-operational Cash Flow, Operational Cash Flow or Stable Cash Flow.

6. After the assumption parameters are selected, click icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

    The Assumption Parameter Specification table has the following columns:
    - Each selected dimension
    - ASF Factor

The unique combinations of selected dimension members are displayed as rows.

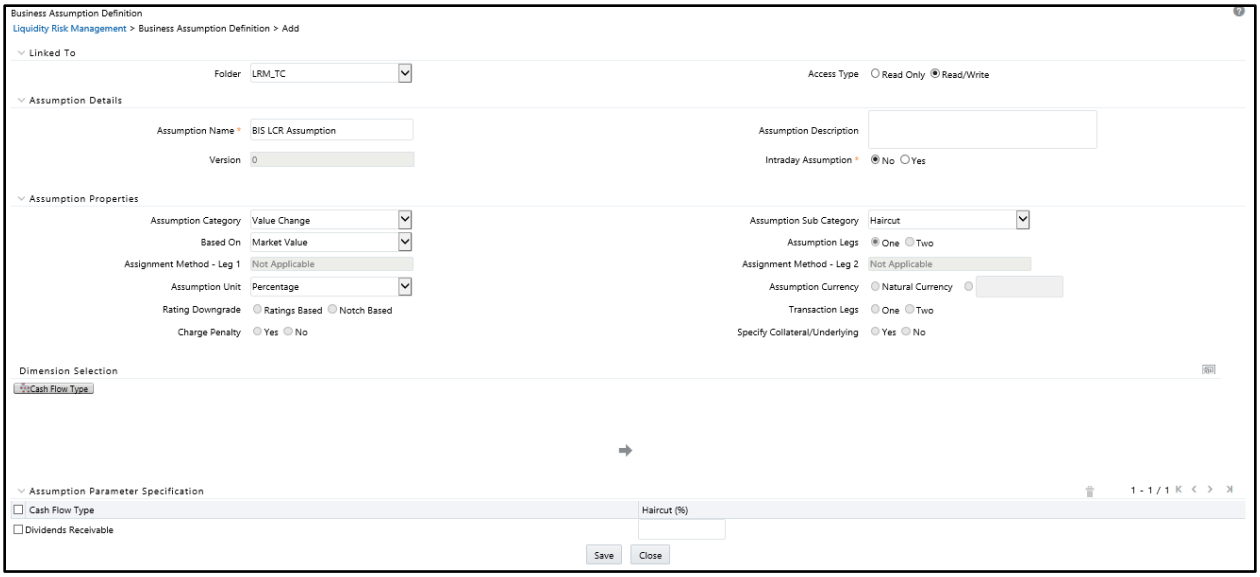
7. To save the definition, click **Save.**

**NOTE:** The time bucket selection is not required as they are not determined and these factors are applied to balances and market values of assets and liabilities.

Refer section Available Stable Funding Factor for detailed explanation and calculations.

### 6.9.4.2 Haircut

When the assumption sub-category is selected as Haircut, perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
   - Fair value
   - Market Value
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Haircut. When one is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. In **Assumption Unit** option, Percentage is selected by default.
4. In **Dimension Selection**, perform the following steps:
   a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
   b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
   c. Click to move the selected dimensions to Selected Members section, or click to select all members.
   d. Click **OK**. The selected dimensions are displayed in the dimension selection section.

e. Click the selected dimension member. The Hierarchy Browser window is displayed.

f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click > to move the selected members to Selected Members section, or click » to select all members.

g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

5. After the assumption parameters are selected, click icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

   The Assumption Parameter Specification table has the following columns:

   - Each selected dimension
   - Haircut (%)

   The unique combinations of selected dimension members and the from buckets are displayed as rows.

6. To save the definition, click **Save**.

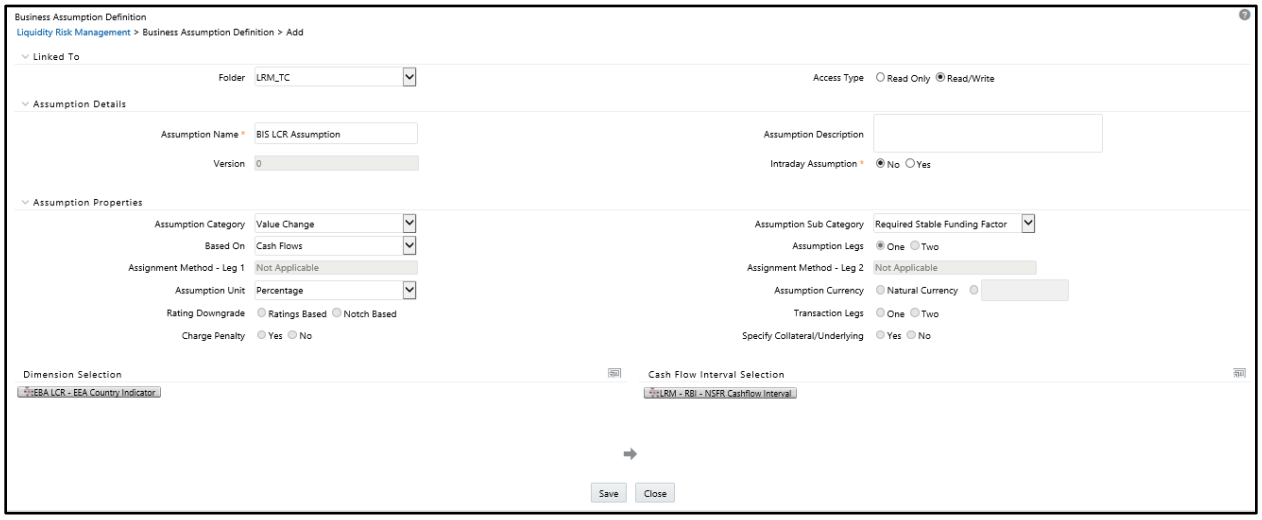
**NOTE:**

The time bucket selection is not required as they are not determined. These haircut values are further used in the Run for the calculation of stock of HQLA.

Refer section Haircut for detailed explanation and calculations.

### 6.9.4.3 Required Stable Funding Factor

When the assumption sub-category is selected as Required Stable Funding Factor, perform the following steps:



1. Choose one of the parameters which must be applied on the different assumption values from the Based On drop-down list:
    - Additional Derivative Liability for RSF
    - Cash Flows
    - Derivative Liability Amount
    - EOP Balance
    - Encumbered Balance
    - Fair Value
    - Fair Value or Collateral Posted
    - GL Balance
    - Initial Margin Posted
    - Market Value
    - Market Value of Collateral Posted
    - NSFR Derivative Assets
    - Net NSFR Derivative Assets
    - Non Contractual Obligation Amount
    - Non-Operational Balance
    - Operational Balance
    - Undrawn Amount
    - Unencumbered Balance
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabl**ed when you** select the sub-category as Required Stable Funding **Factor. When on**e is sele**cted** as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. In **Assumption Unit** option, Percentage is selected by default.
4. In **Dimension Selection**, perform the following steps:
    a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
    c. Click  to move the selected members to Selected Members section, or click  to select all members.
    d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
    e. Click the selected dimension member. The Hierarchy Browser window is displayed.

f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click › to move the selected members to Selected Members section, or click » to select all members.

g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added.

5. In **Cash Flow Interval Selection**, perform the following steps:

a. Click icon for **Cash Flow Interval Selection**. The Cash Flow Interval Selection browser window is displayed.

b. Select a defined Cash flow interval displayed in the browser.

c. Click **OK**. The selected Cash Flow Interval is displayed in the Cash Flow Interval selection section.

d. Click the selected dimension member. The Hierarchy Browser window is displayed.

e. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click › to move the selected members to Selected Members section, or click » to select all members.

f. Click **OK**.

**Note**:

- This selection is enabled only when you select the Based On measure as Cash Flows,

6. After the assumption parameters are selected, click → icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

The Assumption Parameter Specification table has the following columns:

- Each selected dimension
- RSF Factor

The unique combinations of selected dimension members are displayed as rows.

7. To save the definition, click **Save**.

**NOTE:**

The time bucket selection is not required as they are not determined and these factors are applied to balances and market values of assets and liabilities.

Refer section Required Stable Funding Factor for detailed explanation and calculations.

The stress assumptions are defined in business assumption definition window with different values.

## 6.10 Parameters Applicable to Each Intraday Assumption Category

This section is applicable when the Intraday Assumption in the Business Assumption Definition window is selected as Yes.

The intraday assumption category field in Business Assumption Definition window consists of the following four broad categories:

1. Cash Flow Movement
2. Encumbrance
3. Incremental Cash Flow
4. Value Change

Each of the intraday assumption categories has an intraday sub-category which is explained in detailed below.

### 6.10.1 Cash Flow Movement

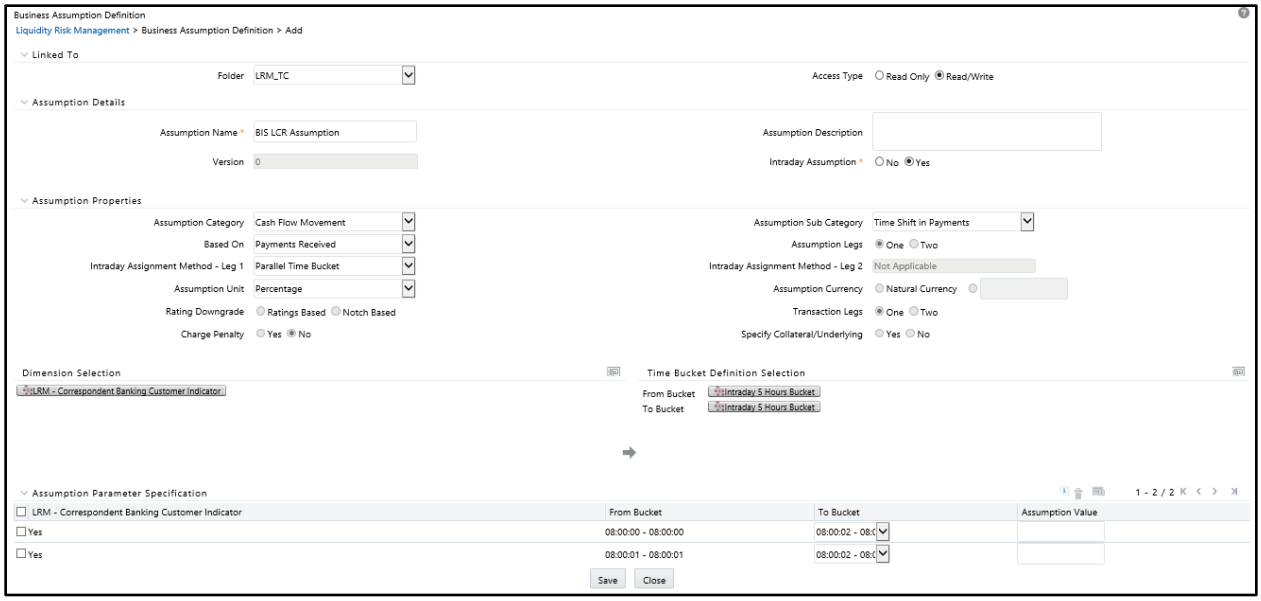
In Assumption Properties, when you select the intraday Assumption Category as **Cash Flow Movement** from the drop-down list the following intraday sub-categories are available for selection:

- Time Shift in Payments
- Payments Default

**NOTE:** Depending upon the assumption category and sub-categories selected, assumption parameters are defined.

#### 6.10.1.1 Time Shift in Payments

When the assumption sub-category is selected as Time Shift in Payments, perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
    - Payments Received
    - Payments Made
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Time Shift in Payments. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. Select the **Intraday Assignment Method – Leg 1** from the drop-down list:
    - Parallel Time Bucket
    - Selected Time Bucket
4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

    **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
7. In **Charge Penalty** option **No** is selected by default.
8. In **Dimension Selection**, perform the following steps:
    a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.

c. Click › to move the selected members to Selected Members section, or click » to select all members.

d. Click **OK**. The selected dimensions are displayed in the dimension selection section.

e. Click the selected dimension member. The Hierarchy Browser window is displayed.

f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click › to move the selected members to Selected Members section, or click » to select all members.

g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added

9. In **Time Bucket Definition Selection**, only the intraday time buckets are allowed for selection. Perform the following steps:

a. Click icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.

c. Click **OK**. The selected time bucket definition is displayed in the time bucket definition selection against both **From Bucket** selection, and **To Bucket** selection.

d. For **From Bucket**, click selected time bucket icon.

One or multiple time buckets from the given time bucket definition can be selected as part of From Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

e. For **To Bucket**, click the selected time bucket icon.

One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of To Bucket selection. The time buckets selected are displayed as drop-down values in the To Bucket column in each row of the assumption specification table.

10. After the assumption parameters are selected, click icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

The Assumption Parameter Specification table has the following columns:

- Each selected dimension
- From Bucket
- To Bucket
- Assumption Value

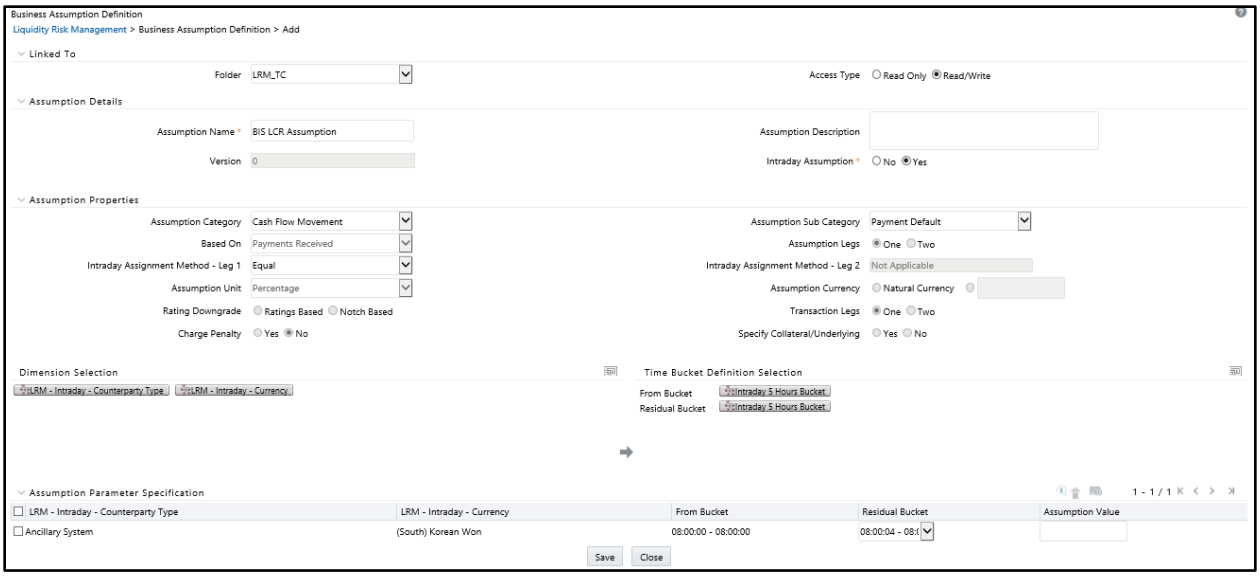
The unique combinations of selected dimension members and from buckets are displayed as rows.

11. To save the definition, click **Save**.

**NOTE:** Refer section Time Shift in Payments for detailed explanation and calculations.

### 6.10.1.2 Payments Default

When the assumption sub-category is selected as Payments Default, perform the following steps:




1. In **Based On**, the **Payments Received** is selected by default.
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Payments Default. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. In **Intraday Assignment Method – Leg 1**, Equal is selected by default.
4. In **Assumption Unit**, Percentage is selected by default.
5. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
6. In **Charge Penalty** option **No** is selected by default.
7. In **Dimension Selection**, perform the following steps:
    a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
    c. Click to move the selected members to Selected Members section, or click to select all members.

d. Click **OK**. The selected dimensions are displayed in the dimension selection section.

e. Click the selected dimension member. The Hierarchy Browser window is displayed.

f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.

g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added

8. In **Time Bucket Definition Selection**, only the intraday time buckets are allowed for selection. Perform the following steps:

a. Click  icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.

c. Click **OK**. The selected time bucket definition is displayed in the time bucket definition selection against **From Bucket** selection.

d. For **From Bucket**, click the selected time bucket icon.

One or multiple time buckets from the given time bucket definition can be selected as part of From Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

e. For **Residual Bucket**, click the selected time bucket icon.

One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of Residual Bucket selection. The time buckets selected are displayed as drop-down values in the Residual Bucket column in each row of the assumption specification table.

9. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

The Assumption Parameter Specification table has the following columns:

- Each selected dimension
- From Bucket
- Residual Bucket
- Assumption Value

The unique combinations of selected dimension members and the from buckets are displayed as rows.

10. To save the definition, click **Save**.

**NOTE:** Refer section payments Default for detailed explanation and calculations.

## 6.10.2 Encumbrance

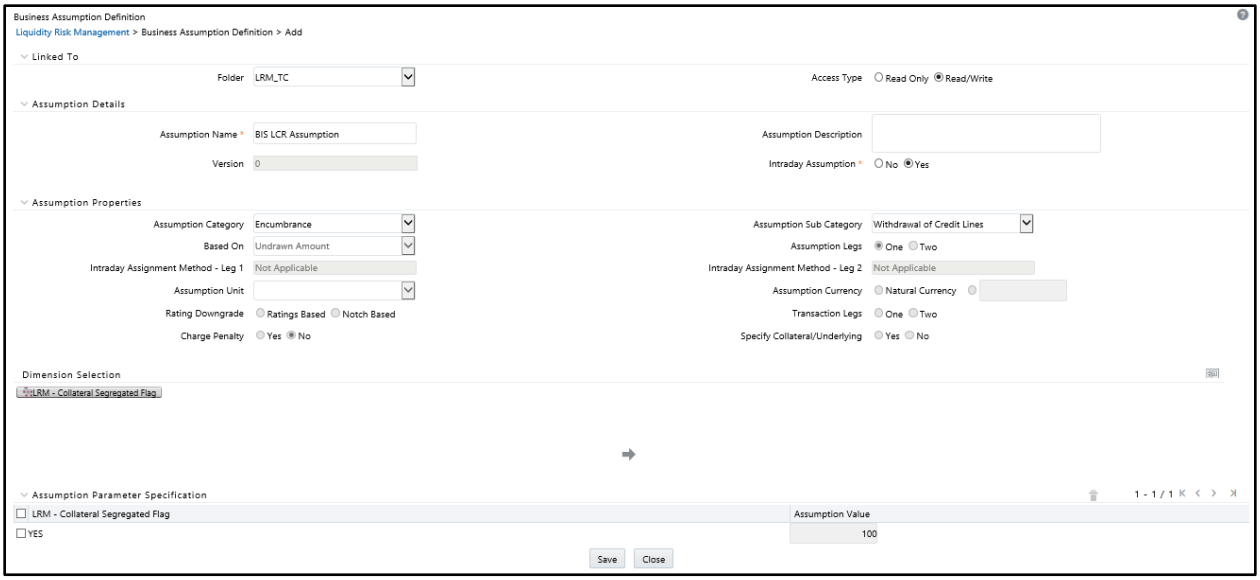
In Assumption Parameters, when you select the Intraday Assumption Category Encumbrance as from the drop-down list the following Intraday sub-category is available for selection:

- Withdrawal of Credit Lines

**NOTE:** Depending upon the assumption category and sub-categories selected, assumption parameters are defined.

### 6.10.2.1 Withdrawal of Credit Lines

When the assumption sub-category is selected as Withdrawal of Credit Lines, perform the following steps:




1. In **Based On**, the Undrawn Amount is selected by default.
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Withdrawal of Credit Lines. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. In the **Assumption Unit**, Percentage is selected by default.
4. In **Charge Penalty** option **No** is selected by default.
5. In **Dimension Selection**, perform the following steps:
   a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
   b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.

c. Click › to move the selected dimensions to Selected Members section, or click » to select all members.

d. Click **OK**. The selected dimensions are displayed in the dimension selection section.

e. Click the selected dimension member. The Hierarchy Browser window is displayed.

f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click › to move the selected members to Selected Members section, or click » to select all members.

g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added

6. After the assumption parameters are selected, click icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

   The Assumption Parameter Specification table has the following columns:

   - Each selected dimension
   - Assumption Value

7. To save the definition, click **Save**.

**NOTE:** Refer section Withdrawal of Credit Lines for detailed explanation and calculations.

### 6.10.3 Incremental Cash Flow

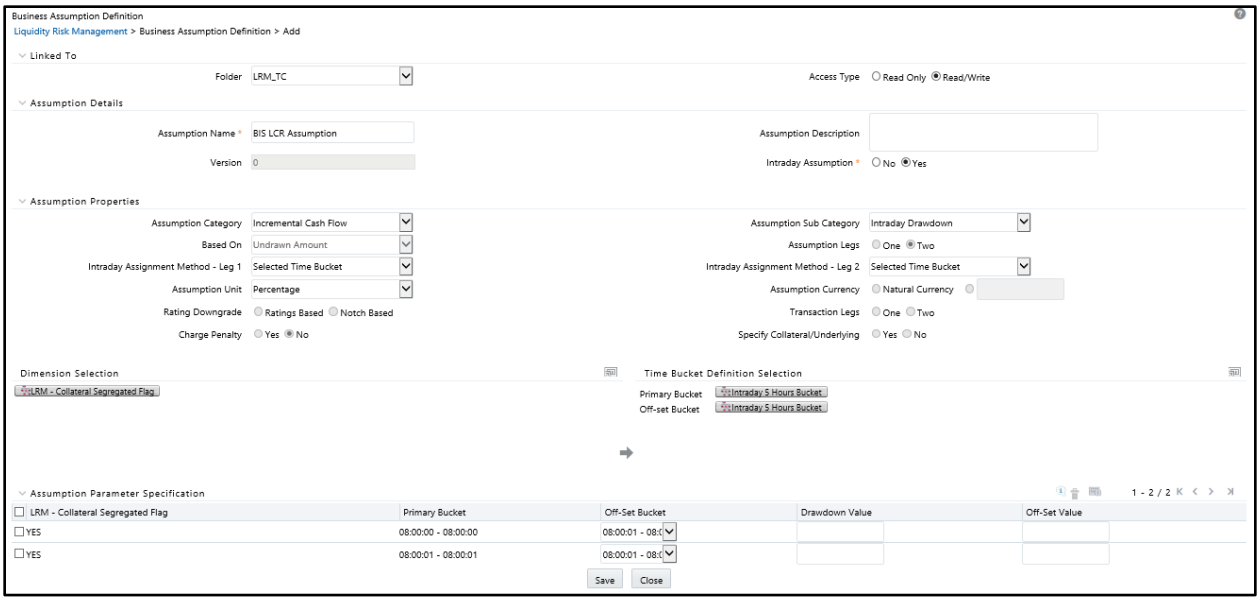
In Assumption Parameters, when you select the Intraday Assumption Category as **Incremental Cash Flow** from the drop-down list the following Intraday sub-categories are available for selection:

- Intraday Drawdown
- Large Unexpected Payments

**NOTE:** Depending upon the assumption category and sub-categories selected, assumption parameters are defined.

### 6.10.3.1 Intraday Drawdown

When the assumption sub-category is selected as Intraday Drawdown, perform the following steps:




1. In **Based On**, the Undrawn Amount is selected by default.
2. In **Assumption Legs** option, **Two** is selected by default. Option One is disabled when you select the sub-category as Intraday Drawdown. When Two is selected as assumption leg, in assumption specification two columns are displayed to add the primary assumption value.
3. Select the **Intraday Assignment Method – Leg 1** and **Assignment Method – Leg 2** from the drop-down list:
    - Selected Time Bucket
4. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
5. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

    **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection.
6. In **Charge Penalty** option **No** is selected by default.
7. In **Dimension Selection**, perform the following steps:
    a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.

c. Click  to move the selected dimensions to Selected Members section, or click  to select all members.

d. Click **OK**. The selected dimensions are displayed in the dimension selection section.

e. Click the selected dimension member. The Hierarchy Browser window is displayed.

f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.

g. Click **OK**.

**Note**:

- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added

9. In **Time Bucket Definition Selection**, only the intraday time buckets are allowed for selection. Perform the following steps:

a. Click  icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.

c. Click **OK**. The selected time bucket definition is displayed in the time bucket definition selection against both **Primary Bucket** selection, and **Off-set Bucket** selection.

d. For **Primary Bucket**, click the selected time bucket icon.

One or multiple time buckets from the given time bucket definition can be selected as part of Primary Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

e. For **Off-set Bucket**, click the selected time bucket icon.

One or multiple time buckets defined as part of the selected time bucket definition can be selected as part of Off-set Bucket selection. The time buckets selected are displayed as drop-down values in the Off-set Bucket column in each row of the assumption specification table.

10. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

The Assumption Parameter Specification table has the following columns:

- Each selected dimension
- Primary Bucket
- Off-Set Bucket
- Downgrade Value

- Off-Set Value

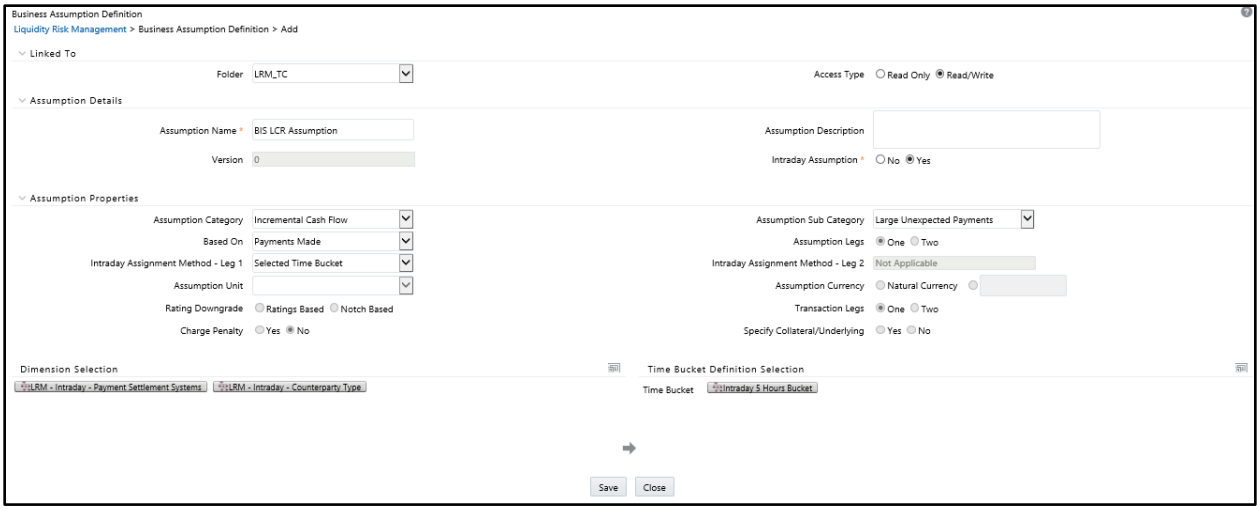
The unique combinations of selected dimension members and the from buckets are displayed as rows.

8. To save the definition, click **Save**.

**NOTE:** Refer section Intraday Drawdown for detailed explanation and calculations.

### 6.10.3.2 Large Unexpected Payments

When the assumption sub-category is selected as Intraday Drawdown, perform the following steps:




1. Choose one of the parameters which must be applied on the different assumption values from the **Based On** drop-down list:
   - Payments Made
   - Payments Received
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category Large Unexpected Payments. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. In **Intraday Assignment Method – Leg 1**, Selected Time Bucket is selected by default.
4. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
5. In **Charge Penalty** option **No** is selected by default.
6. In **Dimension Selection**, perform the following steps:
   a. Click icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
   b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.

c. Click › to move the selected dimension to Selected Members section, or click » to select all members.

d. Click **OK**. The selected dimensions are displayed in the dimension selection section.

e. Click the selected dimension member. The Hierarchy Browser window is displayed.

f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click › to move the selected members to Selected Members section, or click » to select all members.

g. Click **OK**.

**Note**:

- LRM - Intraday - Payment Settlement Systems dimension is selected by default.
- In the dimension panel, you can add only seven dimensions.
- In dimension panel seven dimensions, one actual time bucket must be specified.

7. In **Time Bucket Definition Selection**, only the intraday time buckets are allowed for selection. Perform the following steps:

a. Click icon to select a **Time Bucket Definition**. The Time Bucket Definition Browser window is displayed.

b. Select time bucket definitions from a list of definitions displayed in the time bucket definition browser. Only one time bucket definition can be selected. The values which are defined in the time bucket definition window are displayed here.

c. Click **OK**. The selected time bucket definition, is displayed in the time bucket definition selection against **Time Bucket** selection.

d. For **Time Bucket**, click the selected tiem bucket icon.

One or multiple time buckets from the given time bucket definition can be selected as part of Time Bucket selection. The selected time buckets are displayed as row items in the assumption specification table.

8. After the assumption parameters are selected, click icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

The Assumption Parameter Specification table has the following columns:

- Each selected dimension
- Time Bucket
- Assumption Value

The unique combinations of selected dimension members and from buckets are displayed as rows. An additional text field "Transaction Amount" is displayed where you can enter amount value.

9. To save the definition, click **Save**.

**NOTE:** Refer section Large Unexpected Payments for detailed explanation and calculations.

## 6.10.4 Value Change

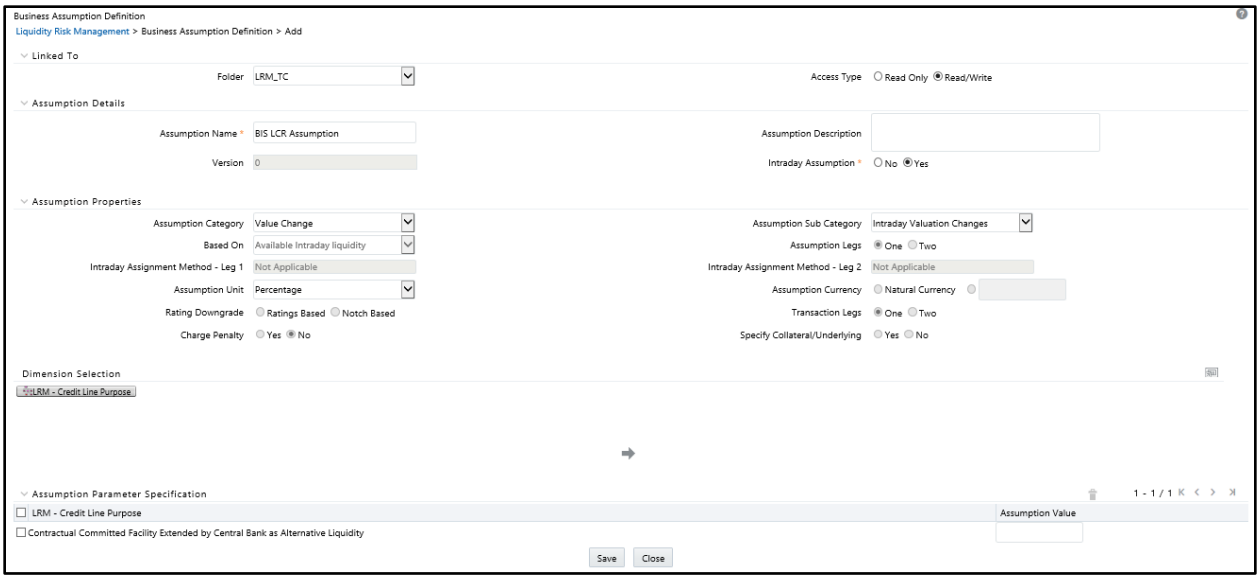
In Assumption Parameters, when you select the Intraday Assumption Category as **Value Change** from the drop-down list the following Intraday sub-category is available for selection:

- Intraday Valuation Changes

**NOTE:** Depending upon the assumption category and sub-categories selected, assumption parameters are defined.

### 6.10.4.1 Intraday Valuation Changes

When the assumption sub-category is selected as Intraday Valuation Changes, perform the following steps:




1. In **Based On**, the Available Intraday Liquidity is selected by default.
2. In **Assumption Legs** option, **One** is selected by default. Option Two is disabled when you select the sub-category as Intraday Valuation Changes. When One is selected as assumption leg, in assumption specification only a column is displayed to add the primary assumption value.
3. Select the **Assumption Unit** from the drop-down list. That is, **Amount** or **Percentage**.
4. Choose the **Assumption Currency** option. This option is enabled when you select the assumption unit as amount. You can either select the option as Natural Currency or choose from the drop-down list.

   **Note**: In case you select Natural Currency, ensure that the currency is selected as part of dimension selection
5. In **Transaction Leg**, option **One** is selected by default. If One is selected, only a column for the specification of each assumption leg is displayed that is one column each for primary and off-set assumption value specification.
6. In **Charge Penalty** option **No** is selected by default.

7. In **Dimension Selection**, perform the following steps:
    a. Click  icon for **Dimension Selection**. The Liquidity Risk Business Dimension browser window is displayed.
    b. Select one or multiple dimensions from a list of dimensions displayed in the dimension browser.
    c. Click  to move the selected dimensions to Selected Members section, or click  to select all members.
    d. Click **OK**. The selected dimensions are displayed in the dimension selection section.
    e. Click the selected dimension member. The Hierarchy Browser window is displayed.
    f. Select one or multiple members from a list of dimensions displayed in the Hierarchy browser. Click  to move the selected members to Selected Members section, or click  to select all members.
    g. Click **OK**.

    **Note**:

    - In the dimension panel, you can add only seven dimensions.
    - In dimension panel seven dimensions, one source or actual time bucket and optionally revised time bucket can be added

8. After the assumption parameters are selected, click  icon on the Business Assumption Definition window. The **Assumption Parameter Specification** table is displayed.

    The Assumption Parameter Specification table has the following columns:

    - Each selected dimension
    - Assumption Value

9. To save the definition, click **Save**.

**NOTE:** Refer section Intraday Valuation Changes for detailed explanation and calculations.

## 6.11 Business Assumption Approval Process

OFS LRM supports approval workflows based on user roles. Business assumptions which are defined within the application are required to be approved which are defined within the application before they can be used for computations. The user who creates the assumption will send it for approval after finalizing it. Assumptions can be approved only by users with the required access levels. For more information refer section User Roles and Access.

### 6.11.1 Sending Business Assumption Definition for Approval

To send a definition for approval, perform the following steps:

1. Click **Business Assumption** on the LHS menu of the LRM Application to open the **Business Assumption Summary** window.

    **Note:**

Assumptions in the following stages can be sent for approval:

a. A new definition which in “Draft” status.

b. A version of a definition which is rejected and is in “Open” status.

c. A definition that is edited and a new version of which is created and is in “In Review” status.

2. Click to select a definition with the status “Draft”, “Open” or “In Review” from the list of business assumptions and then click icon.

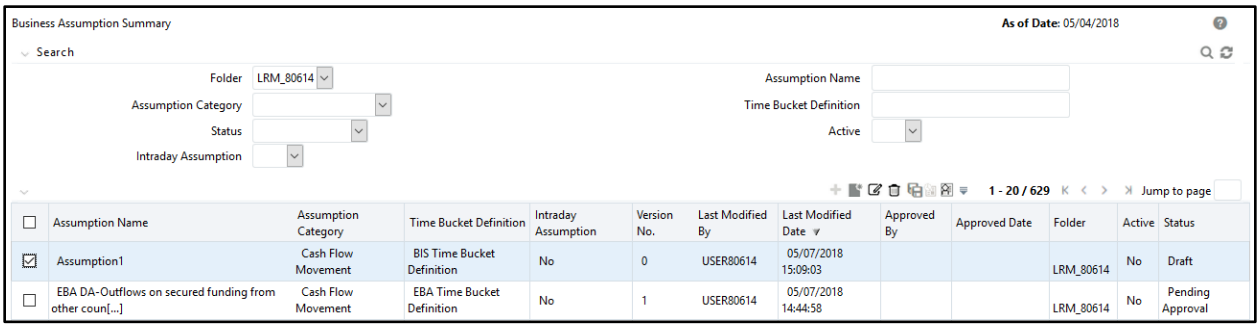



**Figure 18 Business Assumption Summary – Draft status**

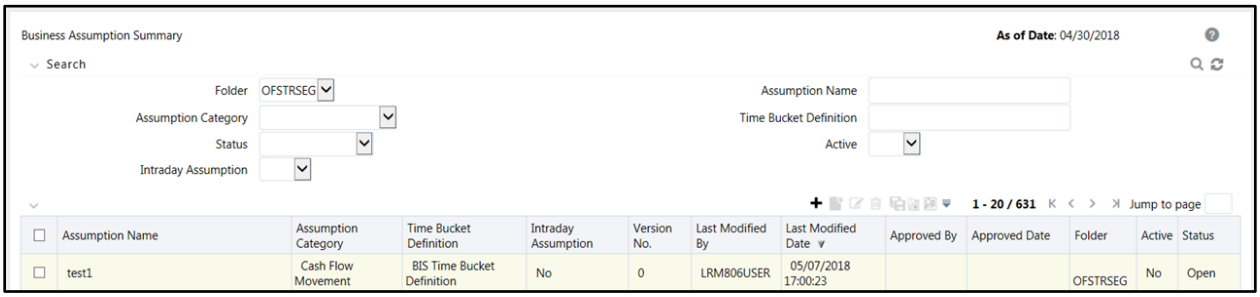



**Figure 19 Business Assumption Summary – Open status**

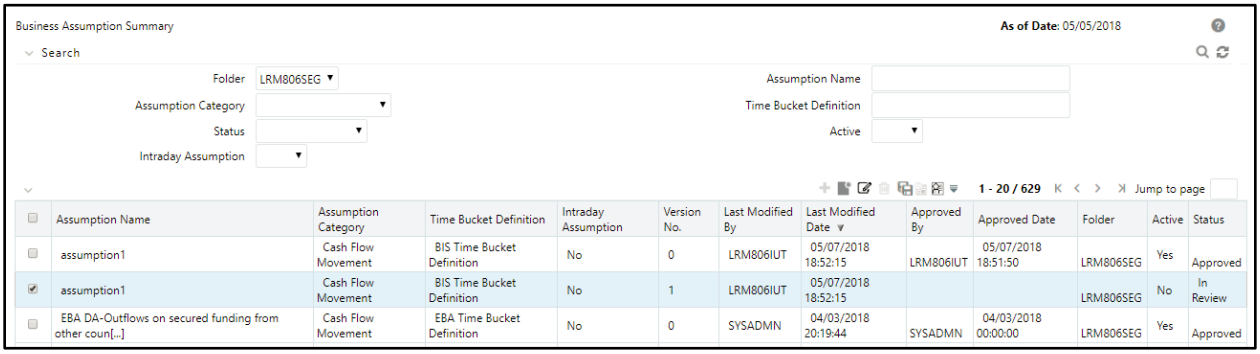



**Figure 20 Business Assumption Summary – In Review status**

The Business Assumption Definition window is displayed with all the parameters defined.

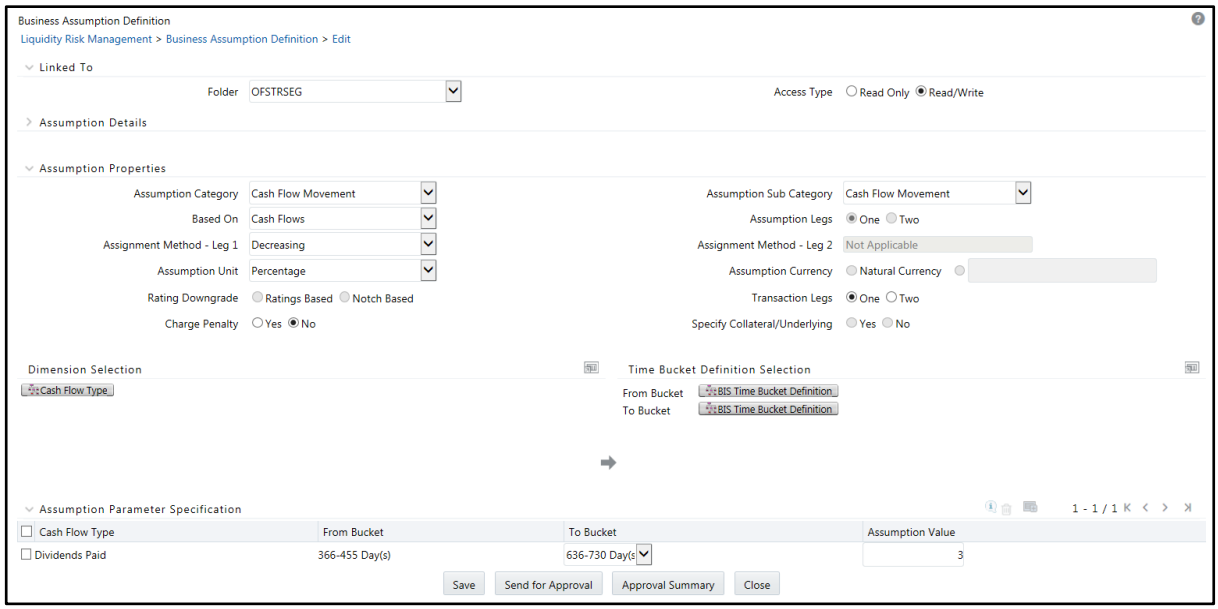



**Figure 21 Business Assumption Summary – Send for Approval**

3. To send a definition for authorization, click **Send for Approval**. This changes the status of the definition to Pending Approval. The definition is successfully sent for approval and the status changes to Pending Approval.

## 6.11.2 Approving a business assumption definition

To approve a business assumption, perform the following steps:

1. Click **Business Assumption** on the LHS menu of the LRM Application to open the **Business Assumption Summary** window. Only assumptions which are in “Pending Approval” status can be approved or rejected by the approver.
2. Click to select a definition with the status “Pending Approval” from the list of business assumptions and then click icon.

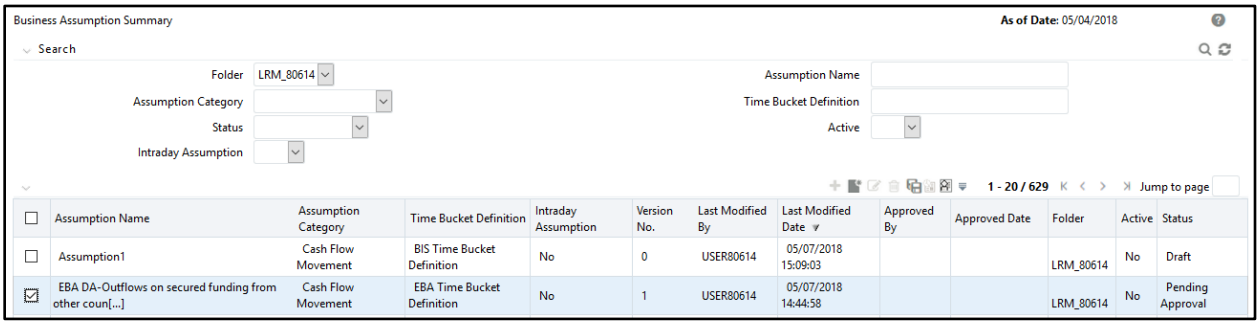



**Figure 22 Business Assumption Summary – Pending Approval**

The Business Assumption Definition window is displayed with all the parameters defined.

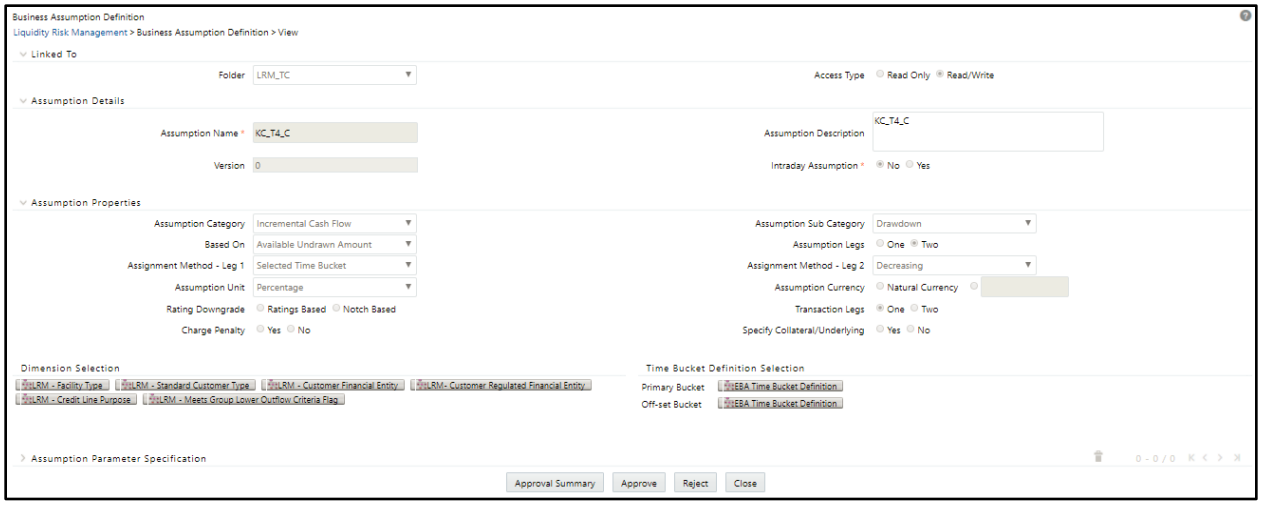



**Figure 23 Business Assumption Summary – Approve/Reject**

3. To approve the definition that is sent for authorization, click **Approve**.

   The Approve dialog box is displayed with the assumption name and description.


**Figure 24 Business Assumptions - Approve**

4. Enter Approver comments and then click **Approve**.
5. To reject the definition that is sent for authorization, click **Reject**.

   The Reject dialog box is displayed with the assumption name and description.

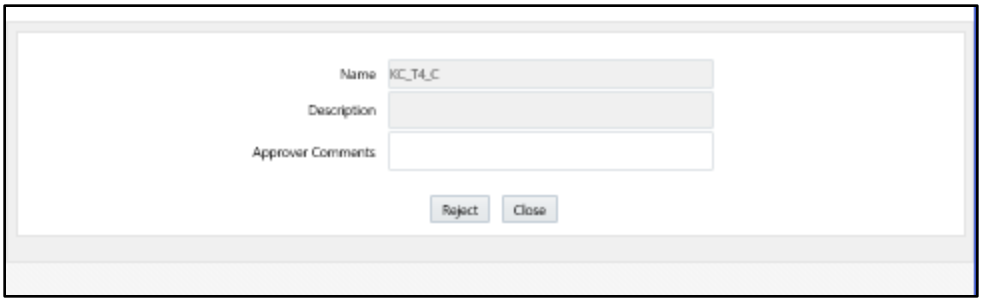



**Figure 25 Business Assumptions - Reject**

6. Enter Approver comments and then click **Reject**.
7. Click  icon to view the summary of the entire approval workflow. It displays approval history showing the start date, completion date, status owner and comments if any.

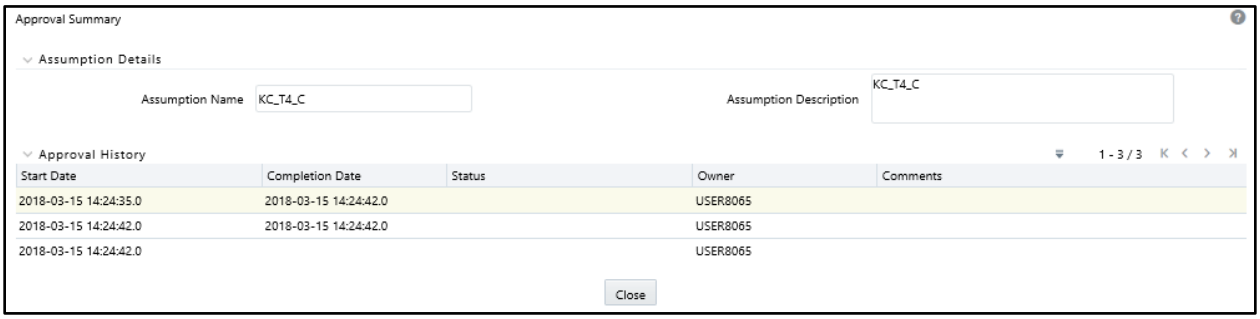



**Figure 26 Business Assumptions – Approval Summary**

**NOTE:**

The Approve or Reject buttons are present only for the users who have the right to approve or reject the definition.

In case the definition is rejected, it changes back to 'Open' status. When the definition is in open status, click View to view the definition. You cannot edit the values in view window.

### 6.11.3 Retiring a business assumption definition

You can retire a business assumption definition when a definition is no longer valid and not required to be included in the selection of a new run calculation. To retire a definition once it is approved, perform the following steps:

1. To retire a definition, click  to select a definition from the list of business assumptions and then click  or  icon.

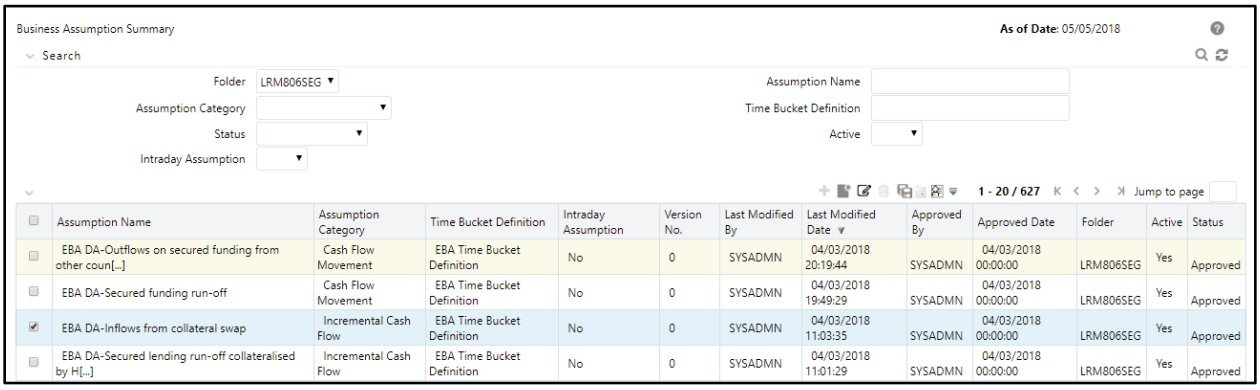
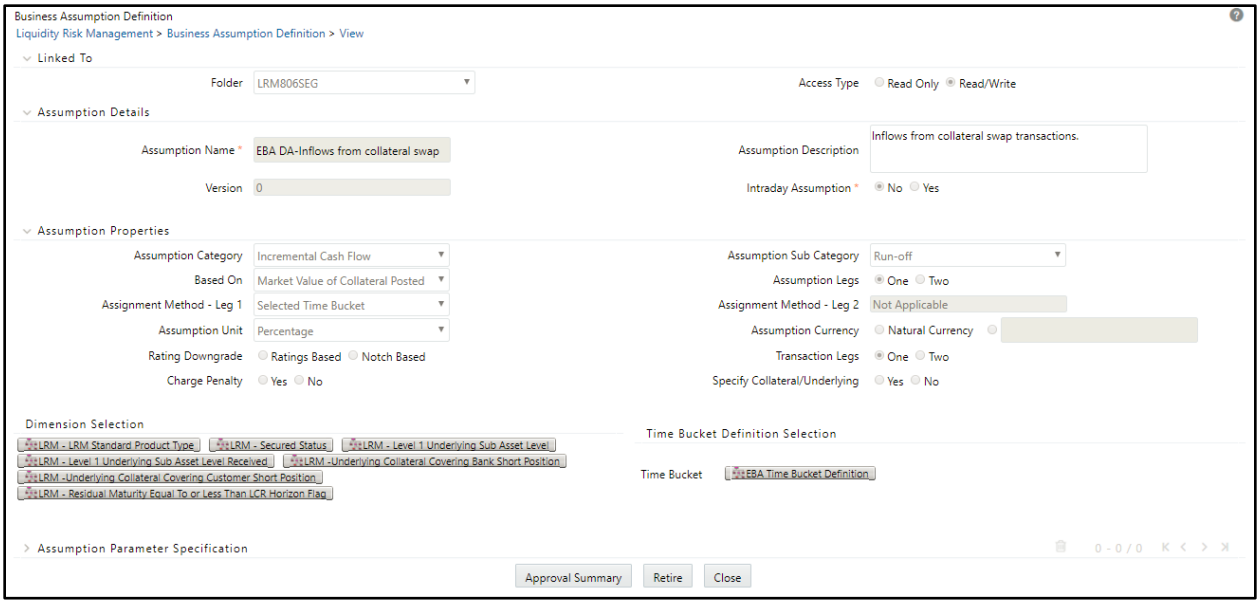



**Figure 27 Business Assumptions – Retire**

The Business Assumption Definition window is displayed.




2. Click **Retire**. A retired definition will not be available for selection as part of a new Run definition

**Note**:

- Once approved, when an assumption is edited and is in "In Review" status but this version of the assumption will not be picked up for execution as the definition is still in "In Review" status. Only when the definition goes through the entire approval process and is approved it is marked as latest and it can be used for execution.
- Once the definition is approved the latest version of such approved definitions are executed. While executing the Run executes the latest version of that assumption (that is, the version marked as latest). Run automatically picks up the definition which is marked as latest. Only the version marked as latest will be executed at a given point of time.
- In case the business conditions change and you require a previously defined version number to make it active, select the assumption from the Business Assumption Summary window and click Make Active icon. Once it is approved, that version is automatically marked as latest but you can always go back and mark a previous version as latest in Business Assumption Summary window (Make Active).
- The status updated in the business assumptions summary window allows you to search the pre-defined business assumption definitions on the basis of approval status. This field displays a list of statuses that you have access to as a drop-down that is, Approved, Draft, In Review, Open, Pending Approval or Retired. Click the drop-down list to select the status. Selection of a status from the drop-down list displays only those business assumptions that have been defined within the selected status in the List of Business Assumption table.
- Business assumption definition can be edited prior to or post approval. If edited prior to approval, it is resaved with the same version number. If edited post approval, it is resaved with a new version number. You cannot edit the definition once sent for approval and is in pending approval status.

- The business assumption definition, once saved and approved, is registered as a Rule in the Rules Framework of Oracle Financial Services Analytical Applications Infrastructure.

## 6.12 Editing a Business Assumption

The process of editing a business assumption is as follows:

1. To edit a definition, click to select a definition from the list of business assumptions and then click icon.

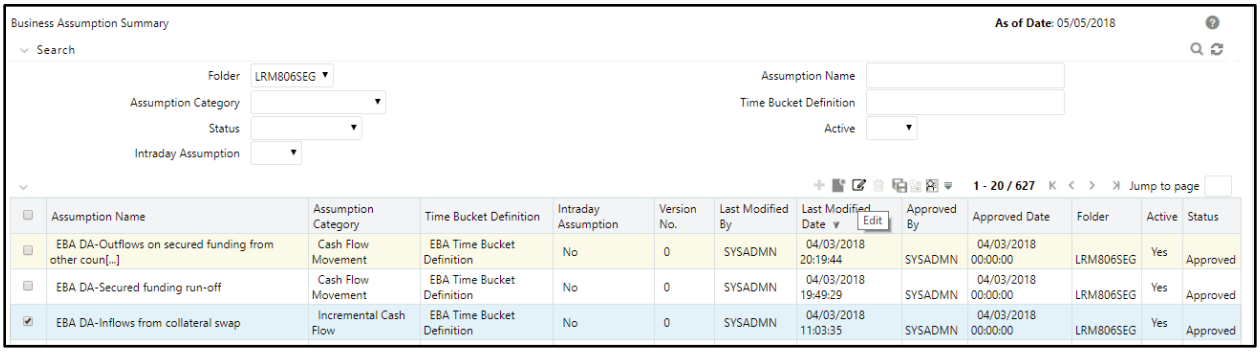



**Figure 28 Business Assumptions – Editing a Business Assumption**

2. You can edit a definition which is in “Draft”, “Open” and “In Review” status. LRM Analyst has the privileges to edit.
3. When the definition is in “Draft” status all the parameters can be edited in the Business Assumption Definition window.
4. When the definition is in “Open” status and “In Review” status all the parameters except the Assumption Name can be edited in the Business Assumption Definition window.
5. When you edit a definition which is “Draft” status, it remains in version 0.
6. When you edit a definition which is in “Open” status, the version number does not change.

   **Note**: In Draft and Open status, the changes made are overwritten and the version number does not change.
7. When you edit a definition which is in approved status, the version number is changed and a new version is created. This changes the status to “In Review”.

# 7 Run Management

## 7.1 Overview

Run Management screen of the LRM application allows you to define, approve and execute Runs. All Runs except stress Runs are defined in the Run Management window of LRM application. The Run, once saved and approved, is registered in the **Rules Framework** > **Run** in Oracle Financial Services Analytical Applications Infrastructure.

## 7.2 Run Definition Parameters

The Run Definition window has the following sections for defining parameters:

- Linked To
- Run Definition Details
- Run Parameters
- Legal Entity Selection (in case of Contractual Run)
- Business Assumptions (in case of BAU Run)

### 7.2.1 Linked To

The details must be specified as follows:

- **Folder**: Select the **Folder** which is specific to the Run definition.
- **Access Type**: Choose the access type option, Read/Write or Read Only.

### 7.2.2 Run Definition Details

The details for each Run definitions are entered here as follows:

- **Run Name**: Specify the Run name.
- **Run Description**: Enter the Run description.

### 7.2.3 Run Parameters

The parameters for each Run definitions are entered here as follows:

#### 7.2.3.1 Purpose

The purpose is the reason for executing each Run. Each purpose has a set of specific calculations associated with it which require different pre-packaged rules and processes to be executed. On selection of a purpose, the relevant rules to support that computation are selected and executed.

Select the **Purpose** from the drop-down list. The drop-down list displays the following:

- **Basel III Liquidity Ratios Calculation**: Selection of this purpose enables the calculation of the Liquidity Coverage Ratio and Net Stable Funding Ratio in accordance with BIS guidelines.
- **EBA Delegated Act Liquidity Ratio Calculation**: Selection of this purpose enables the calculation of the Liquidity Coverage Ratio in accordance with EBA Delegated Act guidelines
- **FR 2052 a Report Generation**: Selection of this purpose enables re-classification of accounts into the regulatory reporting lines required to generate the FR 2052 a report of US Federal Reserve
- **FR 2052 b Report Generation**: Selection of this purpose enables re-classification of accounts into the regulatory reporting lines required to generate the FR 2052 b report of US Federal Reserve.
- **Intra-Day Metrics Calculation**: Selection of this purpose enables the calculation of the intraday metrics based on the actual payment transaction data received from the bank.
- **Long Term Gap Calculation**: Selection of this purpose enables calculation of liquidity gaps.
- **RBI Basel III Liquidity Ratio Calculation**: Selection of this purpose enables calculation of the RBI Liquidity Coverage Ratio which caters to the final guidelines on the LCR, Liquidity Risk Monitoring Tools and LCR Disclosure Standards.
- **RBI Short-Term Dynamic Liquidity Report Generation**: Selection of this purpose enables calculation of the RBI Liquidity Coverage Ratio which caters to the final guidelines on the LCR, Liquidity Risk Monitoring Tools and LCR Disclosure Standards.
- **RBI Structural Liquidity Report Generation**: Selection of this purpose enables calculation of the RBI Liquidity Coverage Ratio which caters to the final guidelines on the LCR, Liquidity Risk Monitoring Tools and LCR Disclosure Standards.
- **U.S Fed Liquidity Ratio Calculation**: Selection of this purpose enables the calculation of the Liquidity Coverage Ratio in accordance with the guidelines of US Federal Reserve. The FR502a (5G liquidity report) is also generated as part of this Run. The 5G report gets generated when you execute the LCR Run.

**NOTE:**

The above list of purposes is available to execute the relevant rules and processes required to achieve a specific computation. The business assumptions are applied over and above these rules and can be selected as part of a BAU or stress run for each purpose.

FR 2052 a Report Generation and FR 2052 b Report Generation purposes are available only in Contractual Run.

For Intra-Day Metrics Calculation, the Run Type can be either a Contractual or a Stress Run.

#### 7.2.3.2 Run Type

There are three types of Runs supported by LRM:

1. Contractual Run
2. Business as Usual (BAU) Run
3. Stress Run

**1. Contractual Run**

This is the first Run defined using the Run Management window of the LRM Application and carries out the data preparation, aggregation and reclassifications required for computation of liquidity risk metrics under multiple scenarios. Contractual Run computes the as-of-date liquidity position of the organization without taking into account any behavioral conditions and forms the base for all subsequent calculations.

A contractual Run allows you to estimate liquidity gaps based on the contractual cash flows received as a download from the bank. It aggregates cash flows based on user-specified aggregation dimensions, identifies HQLA, allocates insurance and identifies deposit stability and so on. All cash inflows and outflows are assumed to be generated under contractual terms. Contractual execution caters to the as of date liquidity status of the organization without the application of any business assumption.

**2. Business-as-Usual (BAU)**

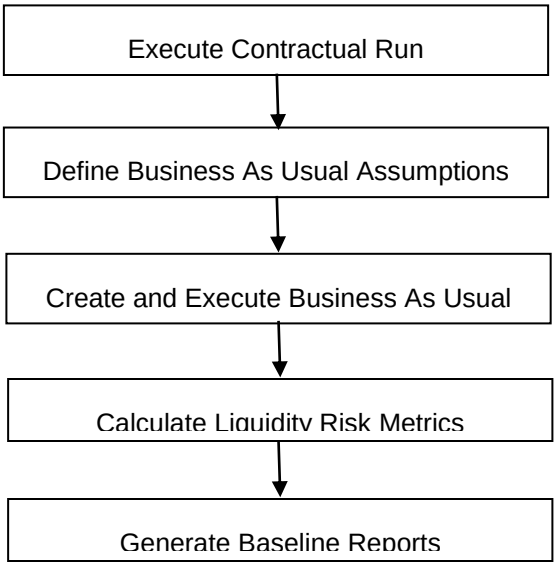
In BAU execution one or multiple business assumptions under normal conditions are applied to the contractual cash flows and the cash inflows and outflows are modified accordingly. A BAU Execution allows you to estimate and analyze the liquidity gaps under normal business conditions. The liquidity gap report (after BAU Execution) provides the liquidity status of the organization based on the impact of these business assumptions on the contractual cash flows. Additionally, liquidity ratios are estimated based on cash flows adjusted for normal conditions in accordance with the Basel III liquidity ratio guidelines prescribed by BIS (refer section BIS Basel III Liquidity Ratios Calculation, in the OFS LRM Regulatory Calculations User Guide Release 8.0.6.0.0 on OHC documentation Library.) as well as LCR based on US guidelines (refer section US Federal Reserve Liquidity Coverage Ratio Calculation, in the OFS LRM Regulatory Calculations User Guide Release 8.0.6.0.0 on OHC documentation Library.)

The features of BAU Run are as follows:

- One or multiple business assumptions are applied to the cash flows and other interim metrics computed as part of the underlying contractual Run. These assumptions and defined as part of the Business Assumption window and selected in a BAU Run for execution.
- All BAU Run parameters are the same as those specified for the underlying contractual Run except for Assumptions Applied To.

- Assumptions are applied on original balance or cash flows or changing balance or cash flows across business assumptions based on user selection.
- Contractual Run is a pre-requisite for defining a BAU Run.

**Process flow of a Business As Usual Run**



a. **Executing BAU or Baseline Run**: A Contractual Run is executed before the Business As Usual Run. Once the liquidity gaps are estimated under contractual terms, the changes in cash flows during the normal course of business due to consumer behavior are to be estimated. This involves defining business assumptions based on multiple rules and specifying assumption values. The assumptions include, drawdown, prepayments, rollovers, asset/liability book growth, run-offs, asset value changes, recovery from delinquent accounts, available stable funding factors, required stable funding factors, and so on. Assumption values specified for each dimension member combination, is selected from pre-defined business hierarchies/dimensions. Once these assumptions are defined, they are grouped together and applied to contractual cash flows as part of the BAU Run or Baseline Run execution process. The impact of these business assumptions on liquidity gaps, ratios, and other metrics is estimated.
b. **Baseline Reports**: LRM generates the Baseline reports that enable a detailed view of the liquidity risk metrics.

**3. Stress Run**

Stress testing is now an integral part of a bank's risk measurement system and plays an important role in estimating the effects of potential financial crises on a bank's operations. Stress testing, from a liquidity risk management perspective, refers to the process of assessing the liquidity position of a financial institution under adverse conditions. It involves defining stress assumptions and applying them to baseline results in order to obtain stressed results.

The application leverages the stress testing module of Oracle Financial Services Advanced Analytical Applications Infrastructure in order to carry out stress testing in an enterprise-wide consistent manner. Stress testing module is an integrated framework of OFSAAAI which supports the stress testing requirements across the entire suite of OFS analytical applications.

Stress Runs are defined as part of the Stress Testing module of OFSAAAI by selecting the baseline Run that is, the LRM BAU Run in the Stress Definition screen and replacing the BAU assumptions which are part of the baseline Run with stress business assumptions. Stress assumptions are business assumptions with adverse values and are defined as part of the Business Assumption screen of LRM. The replacement of BAU assumptions with the stress assumptions constitutes the stress scenario. Once defined and saved, the Stress Run can be viewed, approved and executed from the Run Management screen of LRM.

The Stress Run defined appears in the list of Runs in the Run Management Summary window. You can approve the definition and then execute it. BAU Run is a pre-requisite for defining stress Runs.

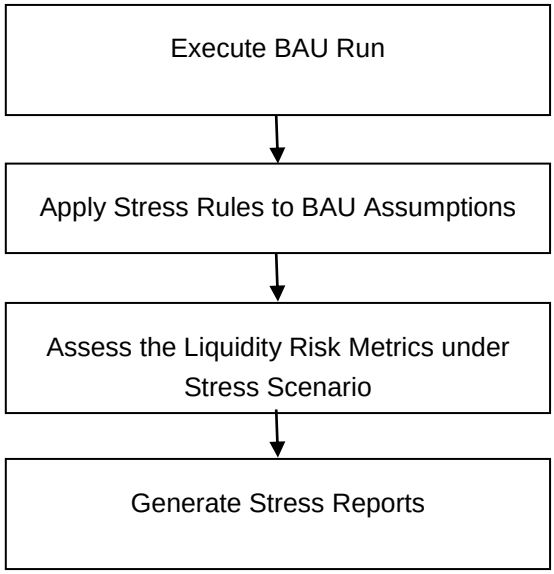
On execution, the stress business assumptions are applied to the contractual cash flows to assess the impact of the adverse scenario on the liquidity position of the institution.

**NOTE:**

Contractual and BAU Run are defined in the Run Management window and are automatically registered in OFSAAAI.

Stress Runs are defined in Stress Testing module of OFSAAAI and registered in OFSAAAI and appears in Run Management window. The stress Runs appear in Draft status with a Run type as Stress in the Run Management window of LRM. You are allowed to approve and execute these Runs.

**Process flow of a Stress Run**




c. **Executing Stress Run**: The Contractual Run is executed first. The BAU Run is executed next. For executing Stress Runs, the Contractual or BAU cash flows are stressed. A combination of stressed assumptions or a stress value of higher magnitude becomes a stress scenario. The values can be applied as absolute values or they can be percentages. The liquidity gaps under the given stress scenario are calculated. The impact of the stress scenario is assessed on Liquidity Coverage Ratio (LCR), Net Stable Funding Ratio (NSFR,) and Funding Concentrations.

d. **Stress Reports**: LRM generates the Stress reports that enable a detailed view of the liquidity risk metrics like Liquidity gaps across time buckets, Cumulative gaps, Gaps across time, Comparison across scenarios , LCR, NSFR, Funding Concentrations, and so on.

#### 7.2.3.3 Contractual Run

When the Run type is selected as Business-As-Usual, the Contractual Run is required to be selected from the Contractual Run browser. The Contractual Run browser displays a list of contractual Runs. The list is filtered by the purpose selected. For example, if the purpose is

selected as Basel III Liquidity Ratios Calculation for a BAU Run, it displays only those Contractual Runs which are specified with that purpose. You are allowed to select a single Contractual Run.

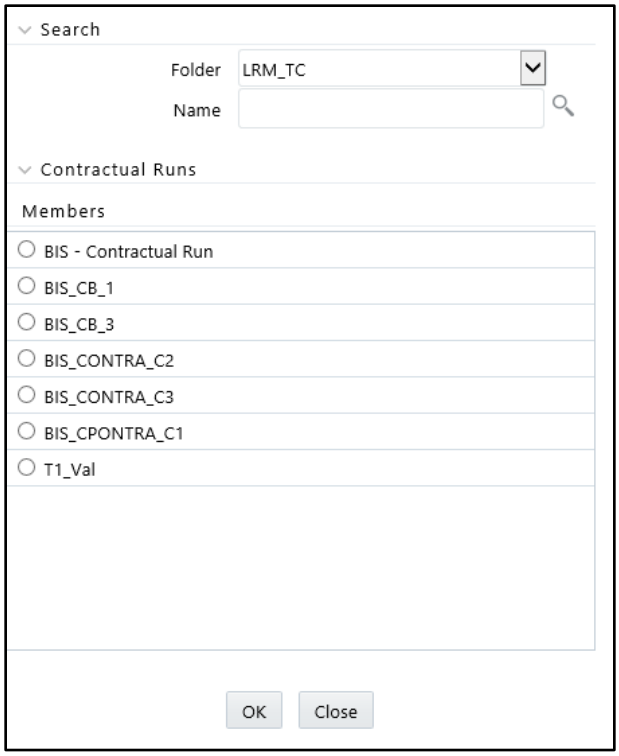



**Figure 29 Run Definition – Contractual Run browser**

#### 7.2.3.4 NSFR Ratio

When the purpose is selected as Basel III Liquidity Ratios Calculation and the Run type is selected as BAU the Liquidity ratio button is enabled for selection in the Run Definition window. Select either of the following options:

- LCR – In case you select LCR, only LCR is calculated
- NSFR – In case you select NSFR, then only NSFR is calculated
- Both - In case you select Both, both NSFR and LCR is calculated in the same Run

#### 7.2.3.5 Time Bucket Definition

When the Run type is selected as Contractual, the Time Bucket Definition is available for selection from the Time Bucket Definition browser. The Time Bucket Definition browser displays the list of computational time buckets defined as part of the Time Bucket window. You are allowed select a single time bucket definition.

**NOTE:** When the Run purpose is selected as Intraday Metrics Calculation, only intraday buckets are listed under the list time bucket definitions section.

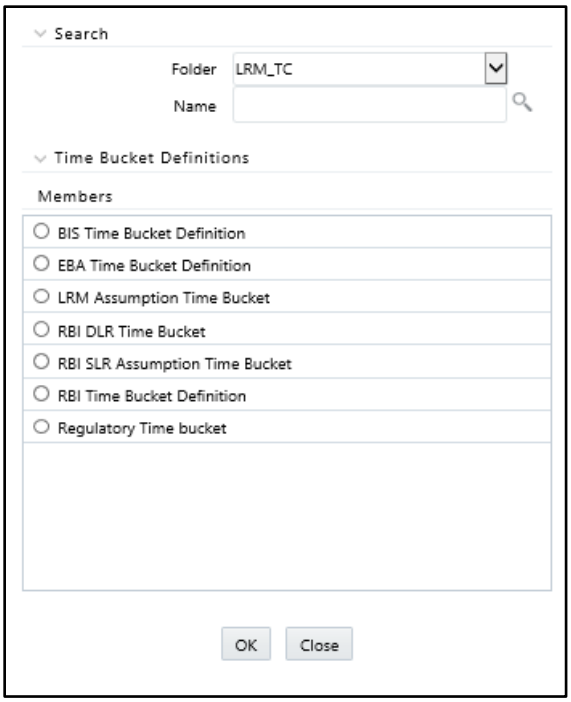



**Figure 30 Run Definition - Time Bucket Definition browser**

#### 7.2.3.6 Time Buckets Based On

When the Run type is selected as Contractual, Time Buckets Based On selection is allowed in the Run Definition window. Select either of the following options:

- Calendar Days:

  The start and end date of each time bucket is computed based on the number of calendar days when this parameter is selected. The time bucket dates are in running calendar day sequence. The time bucket dates are consistent across multiple legal entities each with different holidays.

- Business Days:

  The start and end date of each time bucket is computed based on the number of business days when this parameter is selected. The time bucket dates are not continuous calendar days in this case but will exclude holidays. The time bucket dates will be different for each legal entity based on its respective holiday calendar.

**NOTE:** The default option is calendar days in case of Business-As-Usual.

#### 7.2.3.7 Consolidation Type

When the Run type is selected as Contractual, Consolidation Type selection is allowed in the Run Definition window. This parameter determines if the calculations are to be executed on a standalone basis for one or multiple selected legal entities or on a consolidated basis at the level of the selected legal entity. Select either of the following options from the drop-down:

- Solo
- Consolidated

**NOTE:**

The liquidity gaps, ratios and other metrics are estimated on a standalone (Solo) basis for each selected legal entity or on a consolidated basis at the level of the selected legal entity based on this selection.

#### 7.2.3.8 Consolidation Level

In case you have selected Consolidation Type as Consolidated, you must select in the Consolidation Level to launch the Legal Entity browser for selecting the consolidation level. Select a single legal entity, at which the consolidated liquidity risk measures are to be calculated, from the list of legal entities available in the Legal Entity browser.

**NOTE:**

This selection is applicable only when the Run Type is selected as Contractual Run and Consolidation Type is selected as Consolidated. If you have selected the Consolidation Type as Solo, then Consolidation Level field is disabled and the solo legal entities are to be selected as part of the Legal Entity Selection section.

#### 7.2.3.9 Payment System Consolidation Type

When the Run type is selected as **Contractual** and the purpose is selected as **Intra-Day Metrics Calculation** Payment System Consolidation Type is allowed for selection.

This parameter determines if the calculations are to be executed on a consolidated or standalone basis for one or multiple payment systems. Select either of the following options:

- Consolidated
- Standalone

**NOTE:** By default, the Payment System Consolidation Type is selected as Standalone.

#### 7.2.3.10 Business Day Convention

When the Run type is selected as Contractual, Business Day Convention selection is allowed in the Run Definition window for the purpose of bucketing cash flows. Select either of the following options from the drop-down:

- Conditional Following
- Conditional Prior
- Following
- No Adjustment
- Prior

#### 7.2.3.11 Include Interest Cash Flows

When the Run type is selected as Contractual, Include Interest Cash Flows selection is allowed in the Run Definition window. Select either of the following options:

- Yes – In case you select Yes, both principal and interest cash flows are considered for calculations.
- No – In case you select No, only principal cash flows are considered and interest cash flows are ignored.

#### 7.2.3.12 Approximate Interest

When the Run type is selected as Contractual and when Include Interest Cash Flows are selected as Yes, Approximate Interest selection is allowed in the Run Definition window. Select either of the following options:

- Yes – When Approximate Interest is selected as Yes, the business assumption is applied only to the principal cash flows and the interest cash flows are approximated based on changes to the principal.
- No – In case you select No, the business assumption values are applied to both principal and interest cash flows. However, this application depends on the manner in which the business assumption is defined as follows:
  - If you have selected Cash Flow Type as a dimension in the business assumption and the dimension member as Principal, then assumption is applied only to the principal cash flows.
  - If you have selected Cash Flow Type as a dimension in the business assumption and the dimension member as Interest, then assumption impacts only Interest cash flows.
  - If you have selected Cash Flow Type as a dimension in the business assumption and the dimension member as Principal and Interest, then assumption is applied to both principal and interest cash flows.
  - If you have not selected Cash Flow Type as a dimension in the business assumption, then assumption is applied to both principal and interest cash flows.

#### 7.2.3.13 Forward Rate Interpolation Method

When the Run type is selected as Contractual, Forward Rate Interpolation Method selection is allowed in the Run Definition window. Select either of the following options from the drop-down:

- Linear
- Log Linear

#### 7.2.3.14 Assumptions Applied To

When the Run type is selected as Business-As-Usual, Assumptions Applied To selection is allowed in the Run Definition window. Select either of the following options:

- Changing Balance/Cash Flows – In this case, the change in the cash flows or balances due to the previous assumption will be considered while applying subsequent assumptions.
- Original Balance/Cash Flows – In this case, the assumptions are always applied to the original cash flows or balances without considering the effect of the previous business assumption.

#### 7.2.3.15 Include Forward Date Calculations

When the Run purpose is selected as U.S. Fed Liquidity Ratio Calculation and the Run type is selected as Contractual this parameter is enabled. Select either of the following options:

- Yes: In case you select Yes, the below parameters are enabled to calculate forward date liquidity risk calculations. You can select one or multiple rules, defined as part of the Rule-Run Framework.
- No: In case you select No, , the current spot calculations are carried out.

#### 7.2.3.16 Forward Balance Method Mapping Rule

When the Run purpose is selected as U.S. Fed Liquidity Ratio Calculation and the Run type is selected as Contractual this parameter is enabled.

This selection has LRM - Balance Method Reclassification – Forecast selected by default which is a single selection from a list of forward balance calculation method mapping rules defined in the Rule-Run Framework. This option helps to calculate forward balances for each dimensional combination.

#### 7.2.3.17 Forward Cash Flow Method Mapping Rule

When the Run purpose is selected as U.S. Fed Liquidity Ratio Calculation and the Run type is selected as Contractual this parameter is enabled.

This selection has LRM – Cash Flow Method Reclassification – Forecast selected by default which is a single selection from a list of forward cash flow calculation method mapping rules defined in the Rule-Run Framework. This option helps to calculate forward cash flows for each dimensional combination.

#### 7.2.3.18 Exclude Holidays

When the Run purpose is selected as U.S. Fed Liquidity Ratio Calculation and the Run type is selected as Contractual this parameter is enabled.

This option helps to determine if holidays are included or excluded in Forward Date Liquidity Risk Calculation. This is determined at the time of defining the forward run. Select either of the following options:

- Yes: In case you select Yes, holidays are included in Forward Date Liquidity Risk Calculations at the time of defining a forward Run. For each legal entity, the entity specific holidays are considered if this option is selected.
- No: In case you select No, holidays are excluded in Forward Date Liquidity Risk Calculations.

#### 7.2.3.19 Balance Sheet Adjustment

When the Run purpose is selected as U.S. Fed Liquidity Ratio Calculation and the Run type is selected as Contractual this parameter is enabled. Select either of the following options:

- Yes: In case you select Yes, then the application calculates post balance calculation for each forward date and the balance sheet adjustments are made.
- No: In case you select No, then there is no balance sheet adjustment and no “post balance calculation”.

#### 7.2.3.20 Balance Sheet Adjustment Method

When the Run purpose is selected as U.S. Fed Liquidity Ratio Calculation and the Run type is selected as Contractual this parameter is enabled.

When the Balance Sheet Adjustment is selected Yes, this method is enabled. From the drop-down list select one of the following balance sheet adjustment methods:

- Current Profile Based Increase
- Current Profile Based Decrease
- Cash Adjustment
- Manual Adjustment

#### 7.2.3.21 Balance Sheet Adjustment Rule

When the Run purpose is selected as U.S. Fed Liquidity Ratio Calculation and the Run type is selected as Contractual this parameter is enabled.

When the Balance Sheet Adjustment is selected Yes and the Balance Sheet Adjustment Method is selected as Manual Adjustment this option is enabled. This selection has LRM - Manual Balance Adjustment – Forecast is selected by default.

#### 7.2.3.22 Fixed Interval Forward Date

When the Run purpose is selected as U.S. Fed Liquidity Ratio Calculation and the Run type is selected as Contractual this parameter is enabled. Select either of the following options:

- Yes: In case you select Yes, then the parameters First Forward Date Interval, Forward Date Frequency and Number of Forward Calculations are displayed for selection.
- No: In case you select No, then the Ad Hoc Forward Date Selection section is enabled. You must provide the ad-hoc forward Run details and select one or multiple dates from the calendar.

#### 7.2.3.23 First Forward Date Interval

When the Run purpose is selected as U.S. Fed Liquidity Ratio Calculation and the Run type is selected as Contractual this parameter is enabled.

This is the interval between the as of date and the first forward date for the purpose of forward balance and cash flow calculations. You must enter the value in terms of days.

#### 7.2.3.24 Forward Date Frequency

When the Run purpose is selected as U.S. Fed Liquidity Ratio Calculation and the Run type is selected as Contractual this parameter is enabled.

This is the interval between each forward date in terms of days, weeks and months. You must enter the value which is a whole number greater than 0. From the drop-down list choose Days, Months or Weeks.

#### 7.2.3.25 Number of Forward Calculations:

When the Run purpose is selected as U.S. Fed Liquidity Ratio Calculation and the Run type is selected as Contractual this parameter is enabled.

This determines the number of forward starting days for which forward balances, cash flows and liquidity metrics are calculated as part of the forward date contractual Run. You must enter the value which is a whole number greater than 0.

### 7.2.4 Legal Entity Selection

When Run type is selected as Contractual and the consolidation type is selected as **Solo**, the **Legal Entity Selection** is enabled. You are allowed to select one or multiple legal entities from the Hierarchy browser. The selected legal entities are listed under the Legal Entity Selection section of the browser.

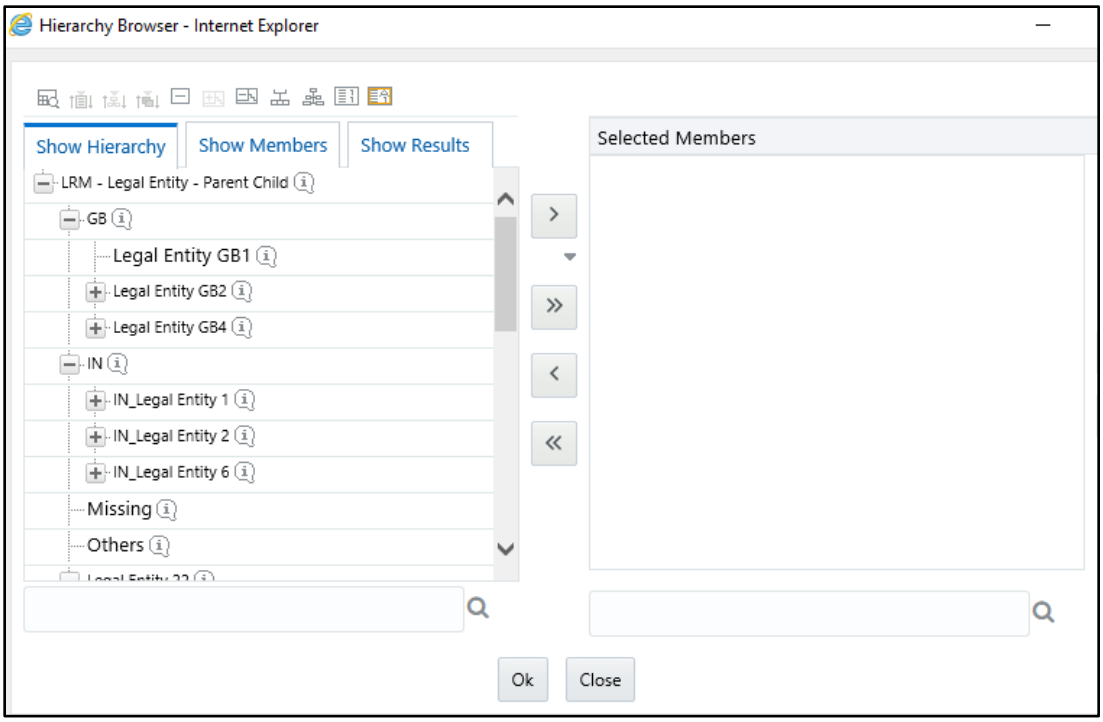



**Figure 31 Run Definition – Hierarchy Browser**

**NOTE:**

The parameters Contractual Run and Assumptions Applied to are applicable only when BAU Run is defined. All other parameters of the BAU Run are the same as those of the underlying contractual Run.

All parameters of the Stress Runs are the same as those of the underlying BAU Run

### 7.2.5 Business Assumptions

When the Run type is selected as Business-As-Usual, you are required to select one or multiple business assumptions to be applied to contractual calculations. The Business Assumptions browser displays a list of all approved business assumptions which have a time bucket definition that corresponds to the definition selected as part of the Run Parameters section. Select one or multiple business assumptions that you want to apply.

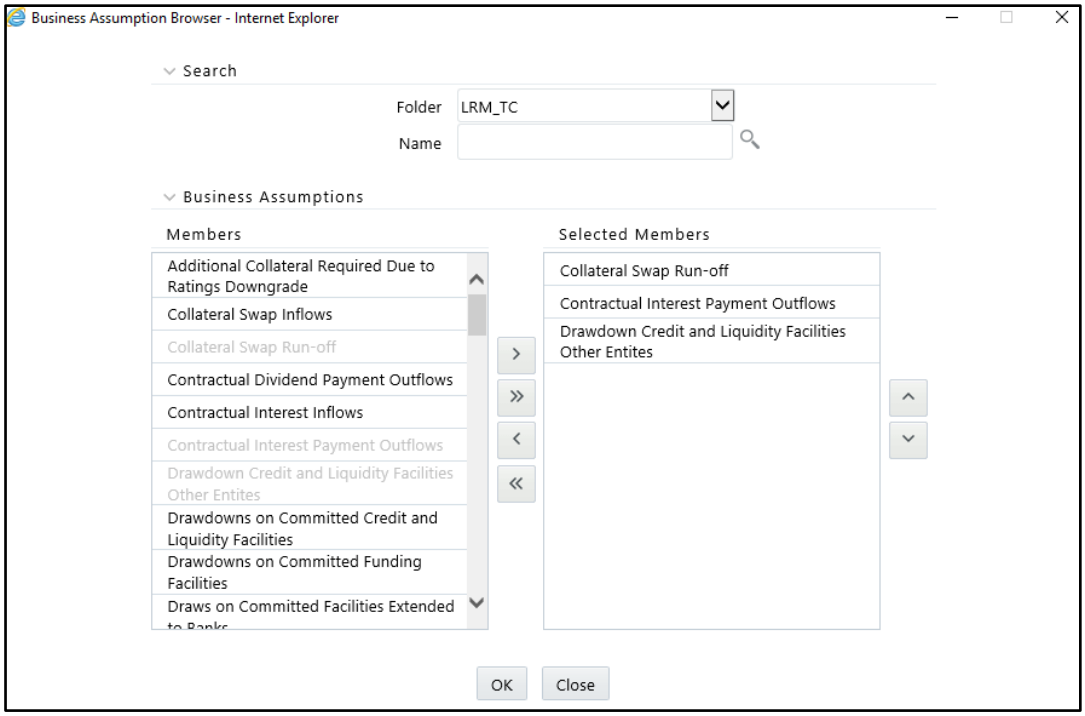
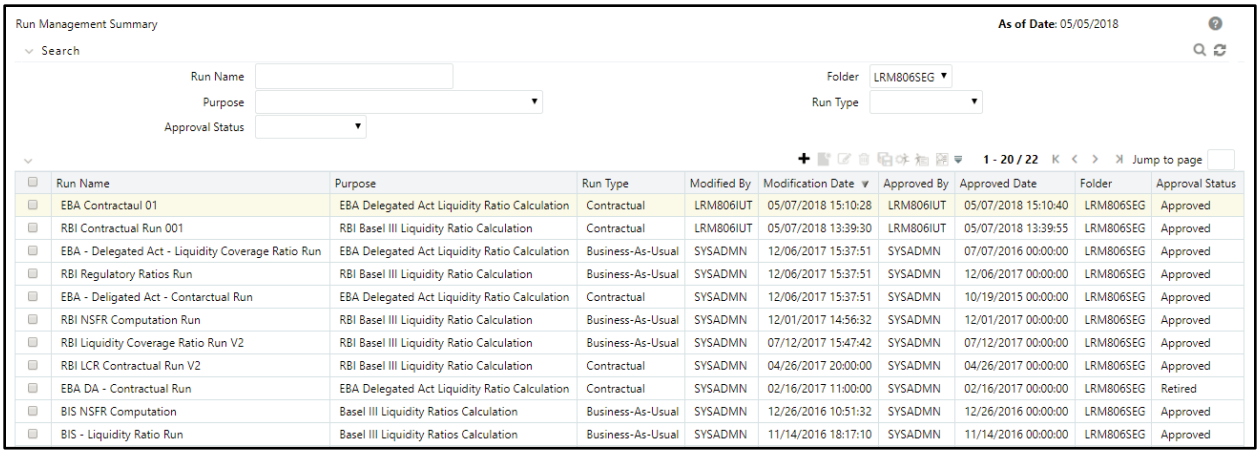



**Figure 32 Run Definition – Business Assumption Browser**

## 7.3 Understanding Run Management Summary

In **Oracle Financial Services Analytical Applications Infrastructure** home screen select, **Financial Services Liquidity Risk Management**.

To open the **Run Management** window, choose **Liquidity Risk Management** > **Run Management** on the Left-Hand Side (LHS) menu.




| Run Name | Purpose | Run Type | Modified By | Modification Date | Approved By | Approved Date | Folder | Approval Status |
|---|---|---|---|---|---|---|---|---|
| EBA Contractaul 01 | EBA Delegated Act Liquidity Ratio Calculation | Contractual | LRM806IUT | 05/07/2018 15:10:28 | LRM806IUT | 05/07/2018 15:10:40 | LRM806SEG | Approved |
| RBI Contractual Run 001 | RBI Basel III Liquidity Ratio Calculation | Contractual | LRM806IUT | 05/07/2018 13:39:30 | LRM806IUT | 05/07/2018 13:39:55 | LRM806SEG | Approved |
| EBA - Delegated Act - Liquidity Coverage Ratio Run | EBA Delegated Act Liquidity Ratio Calculation | Business-As-Usual | SYSADMN | 12/06/2017 15:37:51 | SYSADMN | 07/07/2016 00:00:00 | LRM806SEG | Approved |
| RBI Regulatory Ratios Run | RBI Basel III Liquidity Ratio Calculation | Business-As-Usual | SYSADMN | 12/06/2017 15:37:51 | SYSADMN | 12/06/2017 00:00:00 | LRM806SEG | Approved |
| EBA - Deligated Act - Contarctual Run | EBA Delegated Act Liquidity Ratio Calculation | Contractual | SYSADMN | 12/06/2017 15:37:51 | SYSADMN | 10/19/2015 00:00:00 | LRM806SEG | Approved |
| RBI NSFR Computation Run | RBI Basel III Liquidity Ratio Calculation | Business-As-Usual | SYSADMN | 12/01/2017 14:56:32 | SYSADMN | 12/01/2017 00:00:00 | LRM806SEG | Approved |
| RBI Liquidity Coverage Ratio Run V2 | RBI Basel III Liquidity Ratio Calculation | Business-As-Usual | SYSADMN | 07/12/2017 15:47:42 | SYSADMN | 07/12/2017 00:00:00 | LRM806SEG | Approved |
| RBI LCR Contractual Run V2 | RBI Basel III Liquidity Ratio Calculation | Contractual | SYSADMN | 04/26/2017 20:00:00 | SYSADMN | 04/26/2017 00:00:00 | LRM806SEG | Approved |
| EBA DA - Contractual Run | EBA Delegated Act Liquidity Ratio Calculation | Contractual | SYSADMN | 02/16/2017 11:00:00 | SYSADMN | 02/16/2017 00:00:00 | LRM806SEG | Retired |
| BIS NSFR Computation | Basel III Liquidity Ratios Calculation | Business-As-Usual | SYSADMN | 12/26/2016 10:51:32 | SYSADMN | 12/26/2016 00:00:00 | LRM806SEG | Approved |
| BIS - Liquidity Ratio Run | Basel III Liquidity Ratios Calculation | Business-As-Usual | SYSADMN | 11/14/2016 18:17:10 | SYSADMN | 11/14/2016 00:00:00 | LRM806SEG | Approved |

**Figure 33 Run Management Summary**

The Run management summary window of the LRM application allows you to define, approve and execute Run/s.

This is the search section which contains multiple parameters. You can specify one or multiple search criteria in this section. When you click the search icon, depending up on the search criteria, this filters and displays the relevant search combination parameters under the Run Management Summary as a list.

| **Search** | |
|---|---|
| **Field\Icon** | **Description** |
| Search  | This icon allows you to search the Run definition on the basis of the search criteria specified. Search criteria include a combination of Run Name, Folder, Approval Status and Run Type. The Run definitions displayed in the Run Management Summary table are filtered based on the search criteria specified on clicking of this icon. |
| Reset  | This icon allows you to reset the search section to its default state that is, without any selections. Resetting the search section displays all the existing Run definitions in the Run Management Summary table. |
| Run Name | This field allows you to search the pre-defined Run on the basis of the Run name. Enter the Run name. |
| Folder | This field allows you to search for the pre-defined Run definitions on the basis of the selected folder. This field displays a list of folders that you have access to as a drop-down. Selection of a folder from the drop down list displays only those Run definitions that have been defined within the selected folder/segment in the Run Management Summary table. |
| Run Type | This field allows you to search the pre-defined Run on the basis of Run Type (Contractual, BAU or Stress Run). You need to specify the Run Type here for searching pre-defined Run. |
| Approval Status | This field allows you to search the pre-defined Run on the basis of approval status. This field displays a list of statuses that you have access to as a drop-down that is, Approved, Draft, In Review, Open, Pending Approval or Retired. Click the drop-down list to select Approved or Rejected status. Selection of a status from the drop-down list displays only those Run definitions that have been defined within the selected status in the Run Management Summary table. |

**Table 64 Run Management – Search**

| List of Runs | | |
|---|---|---|
| **Icon Name** | **Icon** | **Description** |
| Add | | This icon allows you to define a new Run. |
| View | | This icon allows you to view the selected Run definitions. |
| Edit | | This icon allows you to edit the selected Run definition. Once the definition is approved, it cannot be edited in the case of Run definitions. |
| Delete | | This icon allows you to delete the selected Run definition. |
| Copy | | The icon allows a definition to be copied and resaved as a new definition. |
| Run Execution Parameters | | This icon allows you to specify execution parameters and execute the Run from the Run Execution Parameters screen. Select the check-box against a Run definition and click the Run Execution Parameters icon to view the Run Execution Parameter Specification window. |
| Run Execution Summary | | This icon displays the Run Execution Summary window. The Run parameters specified as part of the Run Definition window are displayed in an un-editable form in the Run Parameters window. The entire list of executions and their details are displayed for the selected definition in this screen. |
| Workflow Summary | | The icon displays the approval summary for the definition. |

**Table 65 Run Management Summary**

## 7.4 Defining a Run

### 7.4.1 Defining a Contractual Run

The Run Management window allows you to define a new Run or create a new Run definition.

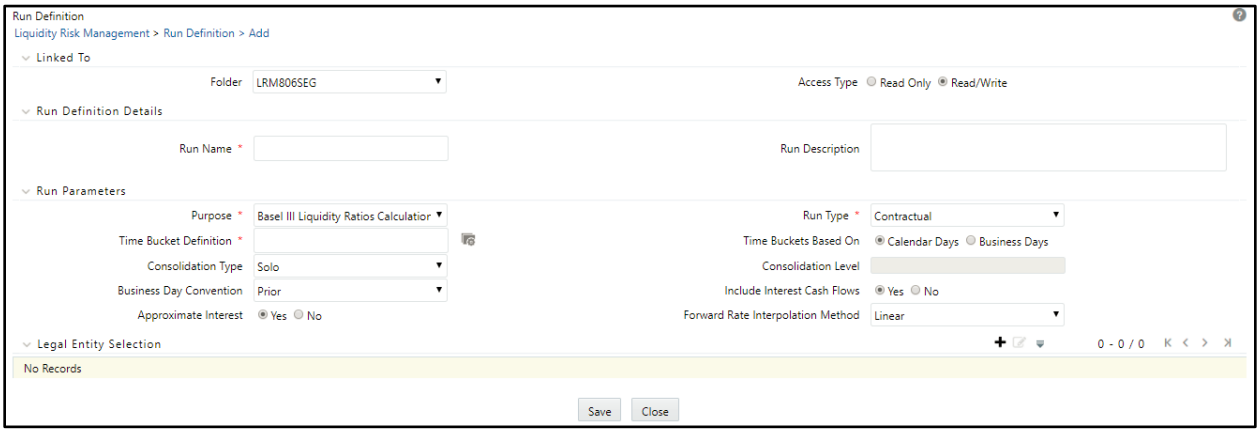



**Figure 34 Run Definition - Contractual Run**

To define a Contractual Run, perform the following steps:

1. Click + icon on the **Run Management** window.

   The **Run Definition** window is displayed where you can define a Run.

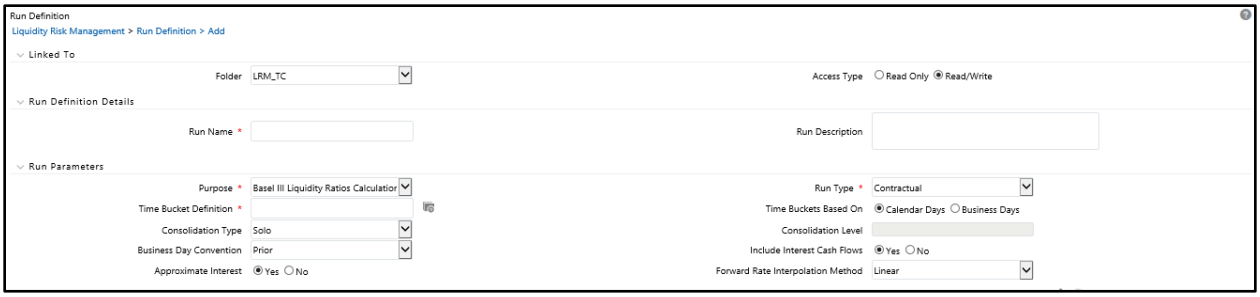
2. In **Linked To** section,
   a. Select the **Folder** from the drop-down list, which is specific to the Run definition. The Run definitions are linked to a segment.
   b. Select the **Access Type**. It is either Read/Write or Read Only option
3. In **Run Definition Details** section,
   a. Enter the **Run Name** which is unique across infodoms.
   b. Enter the **Run Description**.

   **Note**:

   Both the **Run Name** and **Run Description** fields allow special characters.
4. In **Run Parameters** section,
   a. Select the **Purpose** from the drop-down list. The drop-down list displays the following:
      - Basel III Liquidity Ratios Calculation
      - EBA Delegated Act Liquidity Ratio Calculation
      - FR 2052 a Report Generation
      - FR 2052 b Report Generation
      - Intra-Day Metrics Calculation
      - Long Term Gap Calculation
      - RBI Basel III Liquidity Ratio Calculation
      - RBI Short-Term Dynamic Liquidity Report Generation
      - RBI Structural Liquidity Report Generation
      - Regulation YY Liquidity Risk Calculation
      - U.S Fed Liquidity Ratio Calculation

   b. Select the **Run Type** as Contractual from the drop-down list. The drop-down list displays the following:
      - Contractual
      - Business-as-Usual

      **Note**: If the Purpose is selected as Intra-Day Metrics Calculation, Run Type is selected as Contractual by default.
5. When the Run type is selected as **Contractual** and the purpose is selected as **Basel III Liquidity Ratios Calculation** or **Long Term Gap Calculation** perform the following steps:




a. In the **Time Bucket Definition** field, click to select the time bucket definition. The Time Bucket Definition browser displays the list of computational time buckets defined as part of the Time Bucket screen. Select the required time bucket definition and then click **OK**.

b. In the **Time Bucket Definition Based On** field, select either **Calendar Days** or **Business Days**.

c. Select **Consolidation Type** from the drop-down list. It is either **Consolidated** or **Solo**.

d. In case you have selected Consolidation Type as Consolidated, in the **Consolidation Level** field, click to launch the Legal Entity browser for selecting the consolidation level. Select a legal entity, at which the consolidated liquidity risk measures are to be calculated, from the list of legal entities available in the Legal Entity browser.

   This selection is applicable only when the Run Type is selected as Contractual Run and Consolidation Type is selected as Consolidated. If you have selected the Consolidation Type as Solo, then **Consolidation Level** field is disabled.

e. Select the **Business Day Convention** from the drop-down list. The drop-down list displays the following:

   - Prior
   - Conditional Prior
   - Following
   - Conditional Following
   - No Adjustment

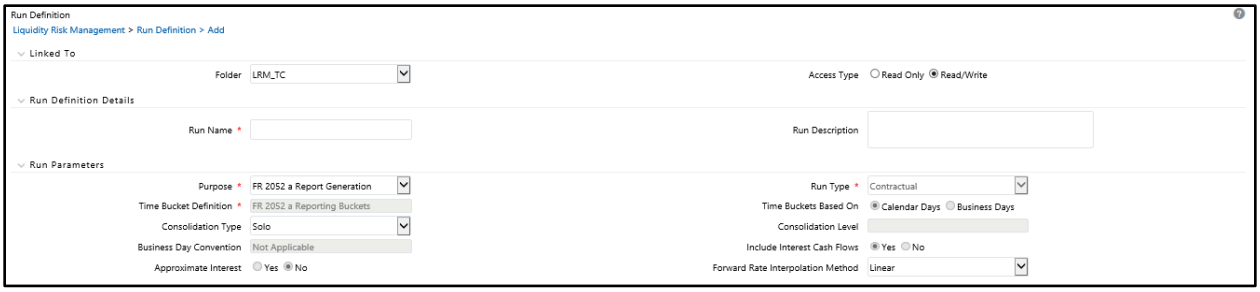
   This is applicable only when Run Type is selected as Contractual Run.

f. Select the **Include Interest Cash Flows** as either **Yes** or **No**.

   **Note:**

   - The Approximate Interest field is disabled if you select Include Interest Cash Flows as No.
   - Select the **Forward Rate Interpolation Method** from the drop-down list. It is either **Linear** or **Log Linear**. This is applicable only when the Run type is selected as Contractual.

6. When the Run type is selected as **Contractual** and the purpose is selected as **FR 2052 a Report Generation** or **FR 2052 b Report Generation** perform the following steps:




a. Select the **Consolidation Type** from the drop-down list. It is either **Consolidated** or **Solo**.

b. In case you have selected Consolidation Type as Consolidated, in the **Consolidation Level** field, click to launch the Legal Entity browser for selecting the consolidation level. Select a legal entity, at which the consolidated liquidity risk measures are to be calculated, from the list of legal entities available in the Legal Entity browser. This is selection is applicable only when the Run Type is selected as Contractual Run and Consolidation Type is selected as Consolidated.

   If you have selected the Consolidation Type as Solo, then **Consolidation Level** field is disabled.

a. Select the **Include Interest Cash Flows** as either **Yes** or **No**.

   **Note:**

   - The Approximate Interest field is disabled if you select Include Interest Cash Flows as No.
   - Select the **Forward Rate Interpolation Method** from the drop-down list. It is either **Linear** or **Log Linear**. This is applicable only when the Run type is selected as Contractual.

7. When the Run type is selected as **Contractual** and the purpose is selected as **Intra-Day Metrics Calculation** perform the following steps:


a. In the **Time Bucket Definition** field, click to select the time bucket definition. The Time Bucket Definition browser displays the list of computational time buckets defined as part of the Time Bucket screen. Select the required time bucket definition and then click **OK**.

   **Note**: Only intraday buckets are listed under the list time bucket definitions section.

b. Select **Legal Entity Consolidation Type** from the drop-down list. It is either **Consolidated** or **Solo**.

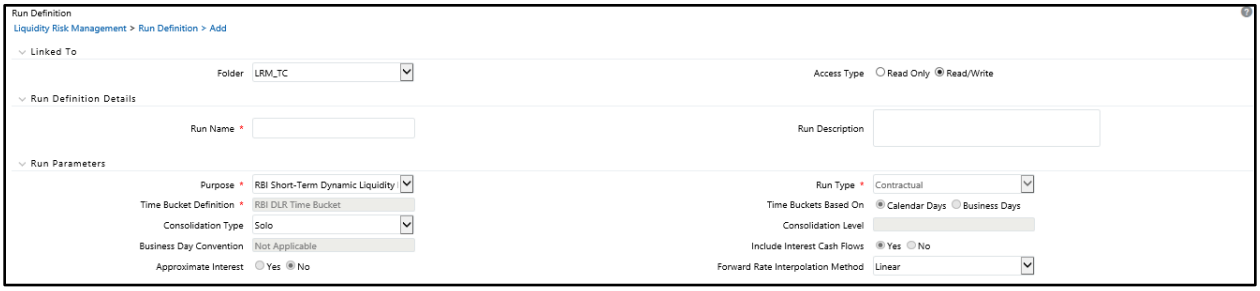
c. In case you have selected **Legal Entity** Consolidation Type as Consolidated, in the **Legal Entity Consolidation Level** field, click to launch the Legal Entity browser for selecting the consolidation level. Select a legal entity, at which the consolidated liquidity risk measures are to be calculated, from the list of legal entities available in the Legal Entity browser.

This selection is applicable only when the Run Type is selected as Contractual Run and **Legal Entity** Consolidation Type is selected as Consolidated. If you have selected the Consolidation Type as Solo, then **Legal Entity Consolidation Level** field is disabled.

d. Select **Payment System Consolidation Type** as either **Consolidated** or **Standalone**.

By default **Standalone** is selected.

8. When the Run type is selected as **Contractual** and the purpose is selected as **RBI Basel III Liquidity Ratio Calculation** or **RBI Short-Term Dynamic Liquidity Report Generation** or **RBI Structural Liquidity Report Generation** perform the following steps:




a. In the **Time Bucket Definition** field, click to select the time bucket definition. The Time Bucket Definition browser displays the list of computational time buckets defined as part of the Time Bucket screen. Select the required time bucket definition and then click **OK**.

**Note**:

- When **RBI Short-Term Dynamic Liquidity Report Generation** is selected as the purpose, **RBI DLR Time Bucket** is selected as the default time bucket.
- When **RBI Structural Liquidity Report Generation** is selected as the purpose, **RBI SLR Assumption Time Bucket** is selected as the default time bucket.

b. In the **Time Bucket Definition Based On** field, select either **Calendar Days** or **Business Days**.

**Note**:

- When RBI Short-Term Dynamic Liquidity Report Generation is selected as the purpose, Calendar Days is selected as the default.
- When RBI Structural Liquidity Report Generation is selected as the purpose, Calendar Days is selected as the default.

c. Select **Consolidation Type** from the drop-down list. It is either **Consolidated** or **Solo**.

d. In case you have selected Consolidation Type as Consolidated, in the **Consolidation Level** field, click to launch the Legal Entity browser for selecting the consolidation level. Select

a legal entity, at which the consolidated liquidity risk measures are to be calculated, from the list of legal entities available in the Legal Entity browser.

This selection is applicable only when the Run Type is selected as Contractual Run and Consolidation Type is selected as Consolidated. If you have selected the Consolidation Type as Solo, then **Consolidation Level** field is disabled.

e. Select the **Business Day Convention** from the drop-down list. The drop-down list displays the following:

- Prior
- Conditional Prior
- Following
- Conditional Following
- No Adjustment

This is applicable only when Run Type is selected as Contractual Run.

**Note**:

- When **RBI Short-Term Dynamic Liquidity Report Generation** is selected as the purpose, this field is not applicable.
- When **RBI Structural Liquidity Report Generation** is selected as the purpose, this field is not applicable.

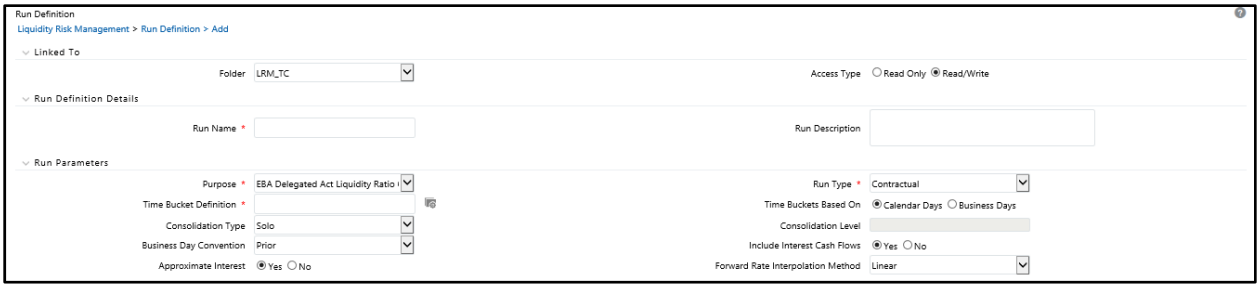
f. Select the **Include Interest Cash Flows** as either **Yes** or **No**.

**Note:**

- The Approximate Interest field is disabled if you select Include Interest Cash Flows as No.
- When **RBI Short-Term Dynamic Liquidity Report Generation** is selected as the purpose, Include Interest Cash Flows is selected as Yes by default.
- When **RBI Structural Liquidity Report Generation** is selected as the purpose, Include Interest Cash Flows is selected as Yes by default.

g. Select the **Forward Rate Interpolation Method** from the drop-down list. It is either **Linear** or **Log Linear**. This is applicable only when the Run type is selected as Contractual.

9. When the Run type is selected as **Contractual** and the purpose is selected as **EBA Delegated Act Liquidity Ratio Calculation** or **Regulation YY Liquidity Risk Calculation** or **U.S Fed Liquidity Ratio Calculation** perform the following steps:




a. In the **Time Bucket Definition** field, click to select the time bucket definition. The Time Bucket Definition browser displays the list of computational time buckets defined as part of the Time Bucket screen. Select the required time bucket definition and then click **OK**.

b. In the **Time Bucket Definition Based On** field, select either **Calendar Days** or **Business Days**.

c. Select **Consolidation Type** from the drop-down list. It is either **Consolidated** or **Solo**.

d. In case you have selected Consolidation Type as Consolidated, in the **Consolidation Level** field, click to launch the Legal Entity browser for selecting the consolidation level. Select a legal entity, at which the consolidated liquidity risk measures are to be calculated, from the list of legal entities available in the Legal Entity browser.

   This selection is applicable only when the Run Type is selected as Contractual Run and Consolidation Type is selected as Consolidated. If you have selected the Consolidation Type as Solo, then **Consolidation Level** field is disabled.

e. Select the **Business Day Convention** from the drop-down list. The drop-down list displays the following:

   - Prior
   - Conditional Prior
   - Following
   - Conditional Following
   - No Adjustment

   This is applicable only when Run Type is selected as Contractual Run.

f. Select the **Include Interest Cash Flows** as either **Yes** or **No**.

   **Note:**

   - The Approximate Interest field is disabled if you select Include Interest Cash Flows as No.

g. Select the **Forward Rate Interpolation Method** from the drop-down list. It is either **Linear** or **Log Linear**. This is applicable only when the Run type is selected as Contractual.

h. When the Purpose is selected as **EBA Delegated Act Liquidity Ratio Calculation** or **U.S Fed Liquidity Ratio Calculation**, select Include Forward Date Calculations as either **Yes** or **No**. In case you select **Yes**, the following options are enabled:

i. The **Forward Balance Method Mapping Rule** displays **LRM - Balance Method Reclassification – Forecast** selected as default.
ii. The **Forward Cash Flow Method Mapping Rule** displays **LRM – Cash Flow Method Reclassification – Forecast** selected by default.
iii. Select the **Exclude Holidays** as either **Yes** or **No**.
iv. Select the **Balance Sheet Adjustment** as either **Yes** or **No**.
v. When you select **Balance Sheet Adjustment** as Yes, the **Balance Sheet Adjustment Method** option is enabled. Select one of the following from the drop-down list, Current Profile Based Increase, Current Profile Based Decrease, Cash Adjustment, Manual Adjustment.
vi. The **Balance Sheet Adjustment Rule** displays **LRM - Manual Balance Adjustment – Forecast** is selected by default when the **Balance Sheet Adjustment Method** is selected as **Manual Adjustment**.
vii. Select the **Fixed Interval Forward Date** as either **Yes** or **No**.
viii. In **First Forward Day Interval** field, enter a value in terms of days.
ix. In the **Forward Date Frequency** field, enter a value which is a whole number greater than 0. From the drop-down list choose Days, Months or Weeks.
x. In the **Number of Forward Calculations** field, enter a value which is a whole number greater than 0.

10. In case you have selected consolidation type as **Solo**, in the **Legal Entity Selection** section, click ✚ to select one or multiple legal entities from the Hierarchy browser and then click **OK**. The selected legal entities are listed under the Legal Entity Selection section. In case you wish to add or edit the legal entities click ✎.

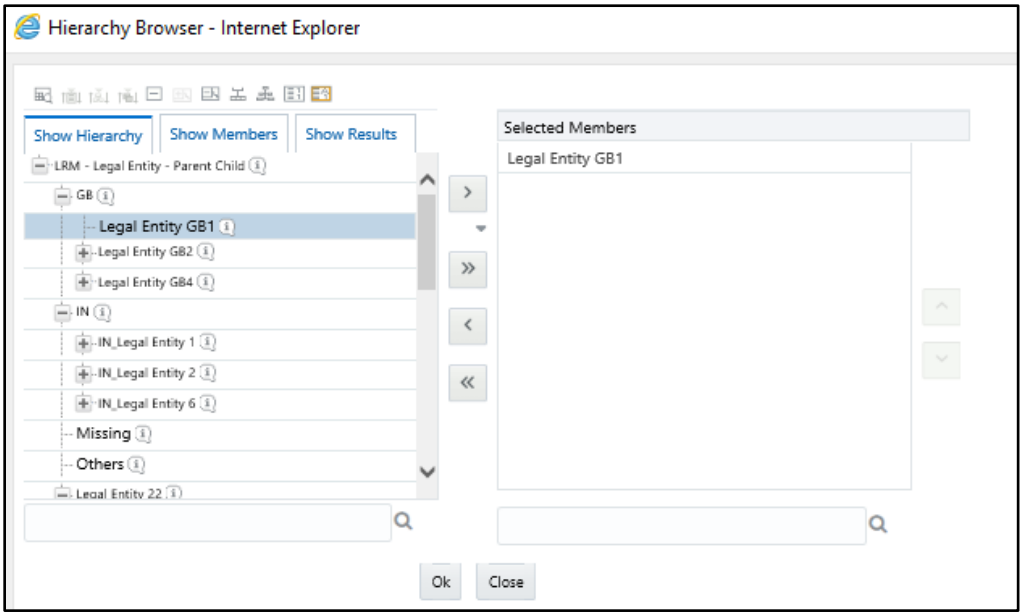



**Figure 35 Run Definition – Hierarchy Browser**

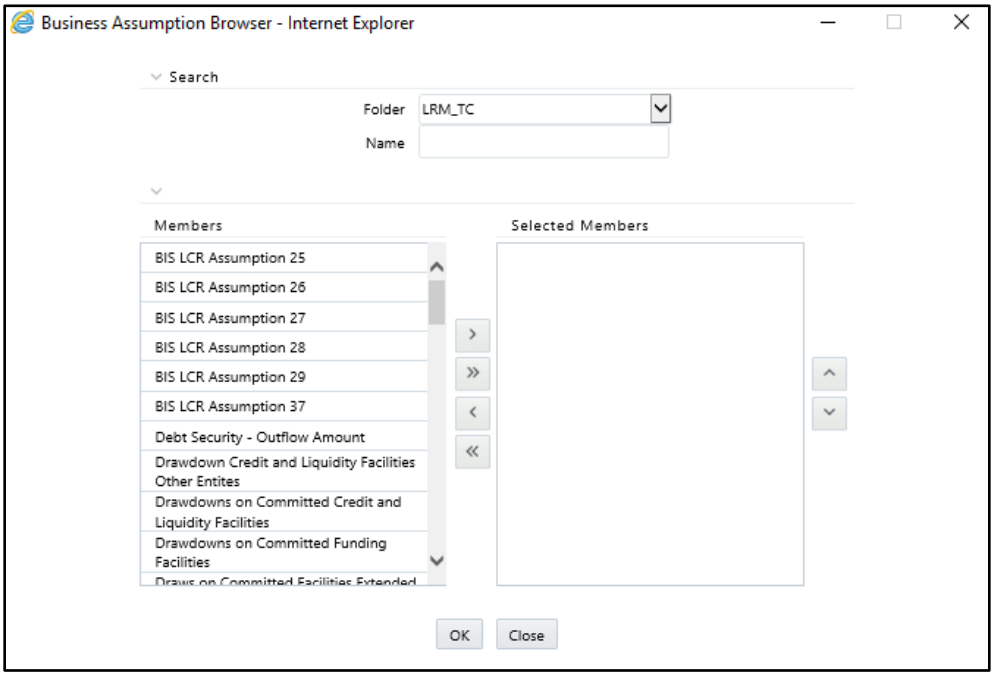
11. When the Purpose is selected as **U.S Fed Liquidity Ratio Calculation** and you have included the Include Forward Date Calculations, perform these additional steps:

a. When the **Fixed Interval Forward Date** is selected as **No**, the **Ad Hoc Forward Date Selection** section is available for selection. Perform the following steps:
   i. Click + to add one or multiple dates.
   ii. Click to select the calendar dates.

   **Note**:

   This section is enabled only when the **Fixed Interval Forward Date** is selected as **No**.

b. When **Include Forward Date Calculations** is selected as **Yes** and all the other parameters are selected the Forward Cash Flow Calculation Business Assumptions section is available for selection. Perform the following steps:
   i. Click + to select one or multiple business assumptions from the Business Assumptions browser and then click **OK**. The selected business assumptions are listed under the Forward Cash Flow Calculation Business Assumptions section. In case you wish to add or edit the business assumptions click.




12. Click **Save**. The Run is saved in the **Run Framework of Oracle Financial Services Analytical Applications Infrastructure**. A Run is available for execution only after it has been approved. Once approved, Run parameters cannot be edited.

### 7.4.2 Defining a Business-As-Usual (BAU) Run

The Run Definition window in the LRM application allows you to define a new Run.

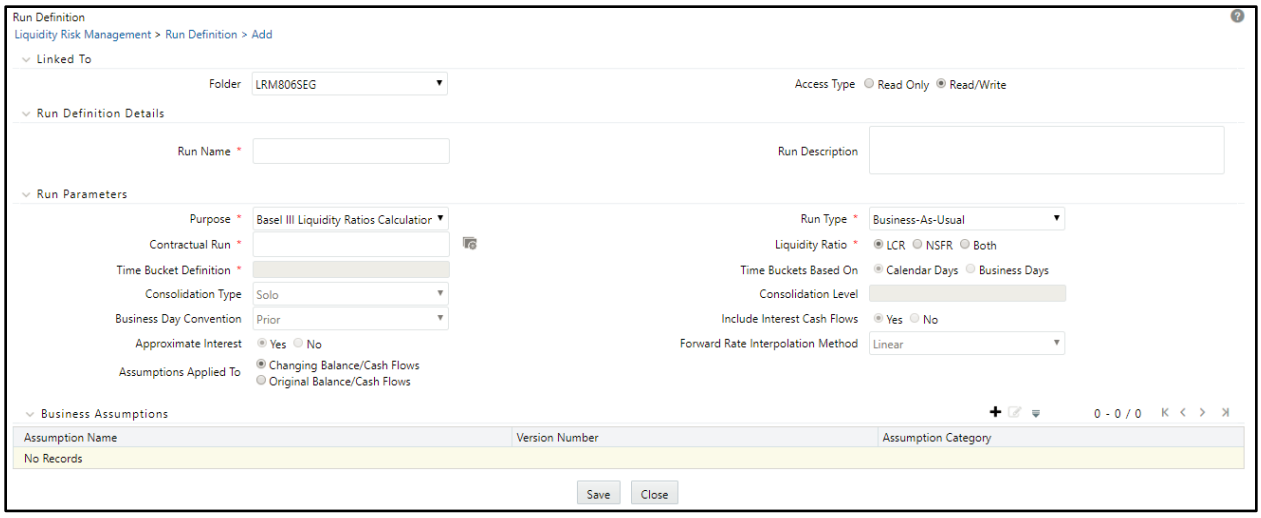



**Figure 36 Run Definition - Business-As-Usual Run**

To define a BAU Run, perform the following steps:

1. Click + icon on the **Run Management** window.

   The **Run Definition** window is displayed where you can define a BAU Run.
2. In **Linked To** section,
   a. Select the **Folder** from the drop-down list, which is specific to the Run definition. The Run definitions are linked to a segment.
   b. Select the **Access Type**. It is either Read/Write or Read Only option
3. In **Run Definition Details** section,
   a. Enter the **Run Name** which is unique across infodoms.
   b. Enter the **Run Description**.

   **Note**:

   Both the **Run Name** and **Run Description** fields allow special characters.
4. In **Run Parameters** section,
   a. Select the **Purpose** from the drop-down list. The drop-down list displays the following:
      - Basel III Liquidity Ratios Calculation
      - EBA Delegated Act Liquidity Ratio Calculation
      - FR 2052 a Report Generation
      - FR 2052 b Report Generation
      - Intra-Day Metrics Calculation
      - Long Term Gap Calculation
      - RBI Basel III Liquidity Ratio Calculation
      - RBI Short-Term Dynamic Liquidity Report Generation

- RBI Structural Liquidity Report Generation
- Regulation YY Liquidity Risk Calculation
- U.S Fed Liquidity Ratio Calculation

b. Select the **Run Type** as Business-As-Usual from the drop-down list. The drop-down list displays the following:

- Contractual
- Business-As-Usual

5. When the Run type is selected as **Business-As-Usual** and the purpose is selected as **Basel III Liquidity Ratios Calculation** or **Long Term Gap Calculation** or **RBI Basel III Liquidity Ratio Calculation** or **Regulation YY Liquidity Risk Calculation** or **U.S Fed Liquidity Ratio Calculation** perform the following steps:

a. In the **Contractual Run** field, click  to select from the list of contractual Runs available in the contractual Run browser.

b. When the Purpose is selected as **Basel III Liquidity Ratios Calculation**, **RBI Basel III Liquidity Ratio Calculation** the 'Liquidity Ratio' field is enabled. This field has three options: LCR, NSFR, Both.

- When **LCR** option is selected, the Run computes the Liquidity Coverage ratio only.
- When **NSFR** option is selected, the Run computes the Net Stable Funding ratio only
- When **Both** is selected, the Run computes both ratios that is, Liquidity Coverage Ratio and Net Stable Funding Ratio.

**Note**:

All other fields in the Run parameters section are consistent with the parameters specified as part of the selected Contractual Run. These fields are in un-editable form based on the Contractual Run selected.

For details on how to add a new custom Run Purpose, and enable NSFR, see Adding a Custom Run Purpose.

Select the **Assumptions Applied To**. It is either **Changing Balance/Cash Flows or Original balance/Cash Flows**. This field is applicable only when the Run type is selected as BAU.

For information on Changing Balance/Cash Flows or Original balance/Cash Flows, refer to section Assumption Calculation

6. In the **Business Assumptions** section, click + icon. The Business Assumptions browser is displayed. All the approved business assumptions with the latest record indicator Y are listed. These have a time bucket definition which corresponds to the definition selected as part of the Run Parameters section.

7. Click > to select one, or click » to select multiple business assumptions that you want to apply to the contractual cash flows and move them to Selected Members section.
8. Using ^ v up or down arrows, you can sequencing of assumptions.

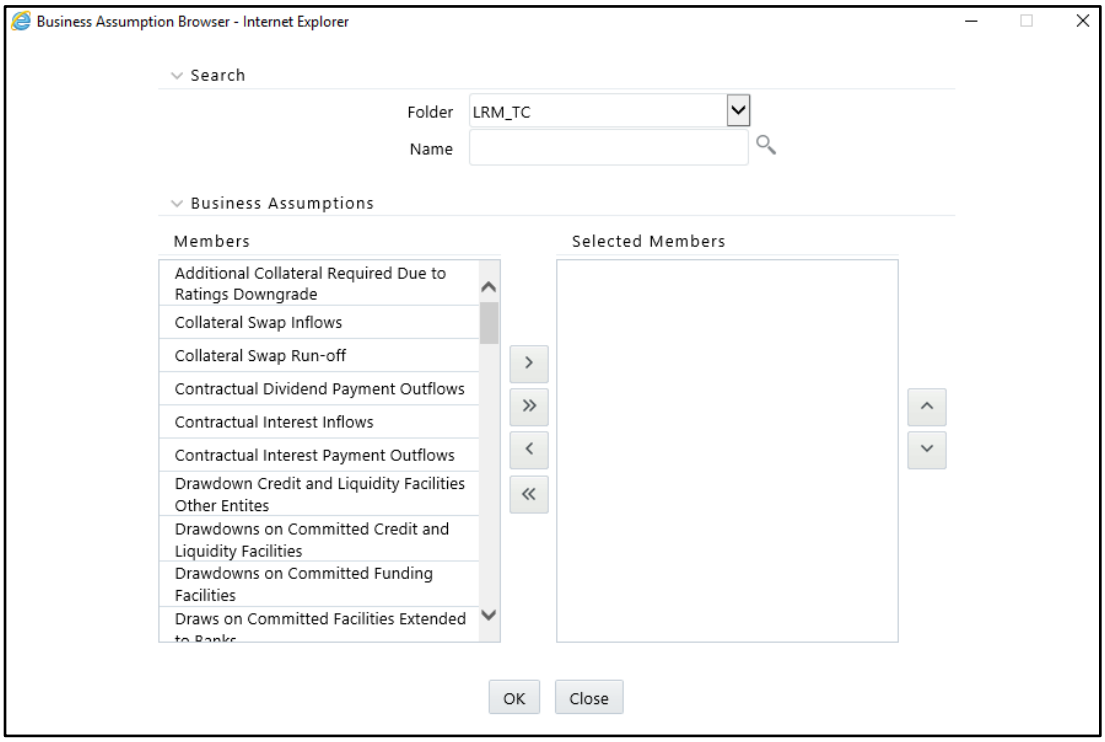



**Figure 37 Run Definition – Business Assumption Browser**

The application saves the assumptions on BAU Run definition window.

9. In case you wish to add or edit the business assumptions click .
10. If you do not wish to save the assumption, click **Close**.
11. The details are displayed under the Business Assumption section for each selected business assumption as follows:
    - Assumption Name
    - Version Number
    - Assumption Category

**Note**:

- Only the approved business assumptions appear in the list.
- For information on **Assumption Category**, refer section Assumption Category.
- The assumptions are executed as per the sequence in which they are selected in the Run Definition screen. This sequence is stored for the purpose of reporting.

12. Click **Save**. The Run is saved in the **Run Framework of Oracle Financial Services Analytical Applications Infrastructure**. A Run is available for execution only after it has been approved. Once approved, Run parameters cannot be edited.

### 7.4.3 Defining a Stress Run

A stress Run is created in the Stress Definition window of the Stress Testing module of **Oracle Financial Services Advanced Analytical Applications Infrastructure (OFSAAAI)**. A business-as-usual Run or Contractual Run is selected as the baseline Run and one or multiple BAU assumptions which are part of the selected baseline Run can be replaced or inserted by stress business assumptions to create a stress Run.

Each stress definition created in the Stress Testing module of OFSAAAI appears as a line item in the Run Management Summary window with the Run type as Stress. You can view, approve and execute a stress Run from the Run Management screen of the LRM application.

There are two ways of defining a Stress Run:

- **Contractual Run**: When the purpose is selected as Intra-Day Metrics Calculation.
- **BAU Run**: For all the purposes other than Intra-Day Metrics Calculation which is Basel III Liquidity Ratios Calculation, FR 2052 a Report Generation, FR 2052 b Report Generation and U.S Fed Liquidity Ratio Calculation.

#### 7.4.3.1 Defining a Stress Run on Contractual Run

For a Contractual Run, insertion of a set of BAU assumptions with another set of stress assumptions constitutes a scenario for stress testing within LRM. Stress business assumptions are similar to BAU assumptions, but with adverse or stressed values. On execution of the stress Run, the stress assumptions are applied to BAU cash flows to assess the impact of the stress scenario on the liquidity metrics.

**NOTE:** The following procedure is applicable for Stress Testing of Intraday Monitoring Metrics.

For Intraday, when Run Purpose is selected as Intra-Day Metrics Calculation and the Run type is Contractual Run perform the following steps:

1. Create a Stress Run in **Oracle Financial Services Advanced Analytical Applications Infrastructure** window through Stress Definition window under **Enterprise Modeling**, after selecting baseline as Contractual Run.
2. Remove the first 4 processes from the base line run one by one:
    a. LRM - Intraday - Party and Product Type Reclassification
    b. LRM - Intraday - Time Bucket Population
    c. LRM - Intraday - Instrument Data Population
    d. LRM - Intraday - Transaction And Aggregated Transaction Data Population

e. LRM - Intraday - Available Intraday Liquidity Classification

3. Select the process as 'LRM - Intraday - Bucketed Transactions Data Population' and then click Insert Task.
4. In the Task browser, select the new process that is, 'LRM – Intraday Stress Data Preparation' and 'LRM - Intraday - Propagating Effect Of Assumptions On Outflows And Inflows '.
5. Set the precedence of the processes in the following order:
   a. LRM – Intraday Stress Data Preparation
   b. LRM - Intraday - Propagating Effect Of Assumptions On Outflows And Inflows
   c. LRM - Intraday - Bucketed Transactions Data Population
6. Click OK.

   The data preparation processes are stitched in the Stress Run.
7. Select the process 'LRM – Intraday Stress Data Preparation' and then click Insert task.
8. In the Task browser, select the defined assumption processes.

   All the versions of the defined assumptions are displayed (Assumption name and version number. You can select the latest one).

   The selected assumptions appear after the process 'LRM – Intraday Stress Data Preparation'.
9. Click OK. The assumptions are stitched in Stress Run.
10. Click Save. The definition is saved.

#### 7.4.3.2 Defining a Stress Run on BAU Run

For a BAU Run, replacement or insertion of a set of BAU assumptions with another set of stress assumptions constitutes a scenario for stress testing within LRM. Stress business assumptions are similar to BAU assumptions, but with adverse or stressed values. On execution of the stress Run, the stress assumptions are applied to BAU cash flows to assess the impact of the stress scenario on the liquidity metrics.

**NOTE:** For more details on the step-by-step creation of a stress Run refer ***Stress Testing*** chapter in Advanced Analytical Applications Infrastructure module in OFSAAI user guide in OHC Documentation Library.

## 7.5 Run Definition Approval Process

OFS LRM supports approval workflows based on user roles. Run definitions which are defined within the application are required to be approved which are defined within the application before they can be used for computations. The user who creates the Run definition sends it for approval after finalizing it. Run definitions can be approved only by users with the required access levels. For more information refer section User Roles and Access.

### 7.5.1 Sending Run definitions for approval

To send a definition for approval, perform the following steps:

1. Click **Run Management** on the LHS menu of the LRM Application to open the **Run Management Summary** window.

   **Note:**

   Run definitions in the following stages can be sent for approval:

   a. A new definition which in “Draft” status.

   b. A version of a definition which is rejected and is in “Open” status.

2. Click to select a definition with the status “Draft”, “Open” from the list of business assumptions and then click icon.

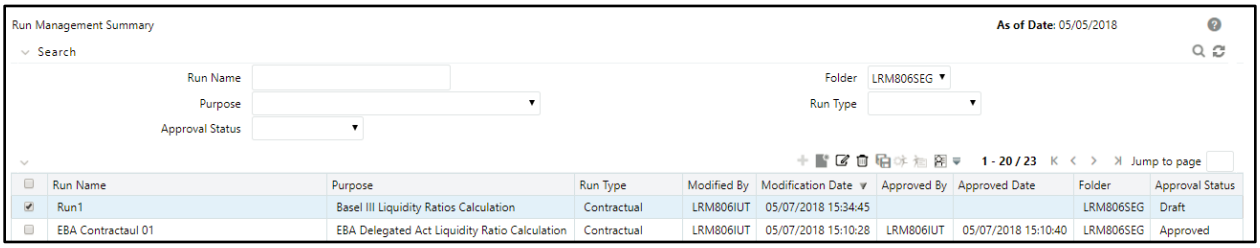



**Figure 38 Run Management Summary – Draft status**

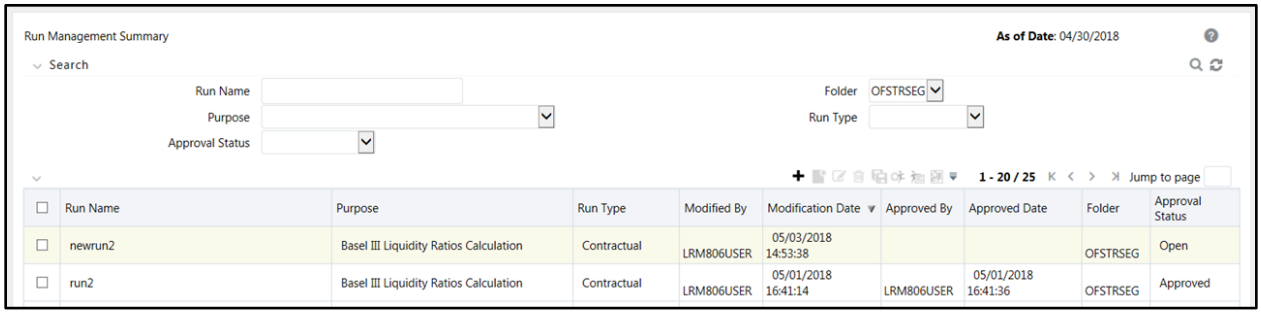



**Figure 39 Run Management Summary – Open status**

The Run Definition window is displayed with all the parameters defined.

**Note**: Stress Runs cannot be edited. The definition is opened in the view mode. To edit the Stress Runs, go to Stress Testing Framework in Advanced Analytics Infrastructure module. In case you have any changes you can edit the parameters and click **Save**.

3. To send a definition for authorization, click **Send for Approval**. This changes the status of the definition to Pending Approval. The definition is successfully sent for approval and the status changes to Pending Approval

   **Note**: Stress Runs can be sent for approval only when the Time Bucket Definition under Run Parameters section and the Time Bucket Definition under Business Assumptions section in Run Definition match.

### 7.5.2 Approving Run definitions

To approve a Run definition, perform the following steps:

1. Click **Run Management** on the LHS menu of the LRM Application to open the **Run Management Summary** window. Only definitions which are in "Pending Approval" status can be approved or rejected by the approver.

   Click to select a definition with the status "Pending Approval" from the list of Run definitions and then click icon.

2. To view the definition in the approval summary window, click **Approval Summary**. You can view the status changes for the definition created.

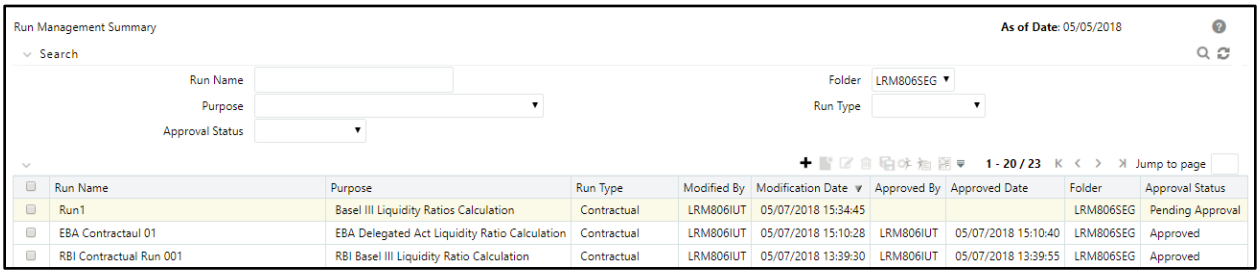



**Figure 40 Run Management Summary – Pending Approval**

You cannot edit the values in view window.

3. To approve the definition that is sent for authorization, click **Approve**.

   The Approve dialog box is displayed with the assumption name and description.


**Figure 41 Run Definition - Approve**

4. Enter Approver comments and then click Approve.
5. To reject the definition that is sent for authorization, click **Reject**.

   The Reject dialog box is displayed with the assumption name and description.


**Figure 42 Run Definition - Reject**

6. Enter Approver comments and then click **Reject**.
7. Click  icon to view the summary of the entire approval workflow. It displays approval history showing the start date, completion date, status owner and comments if any.

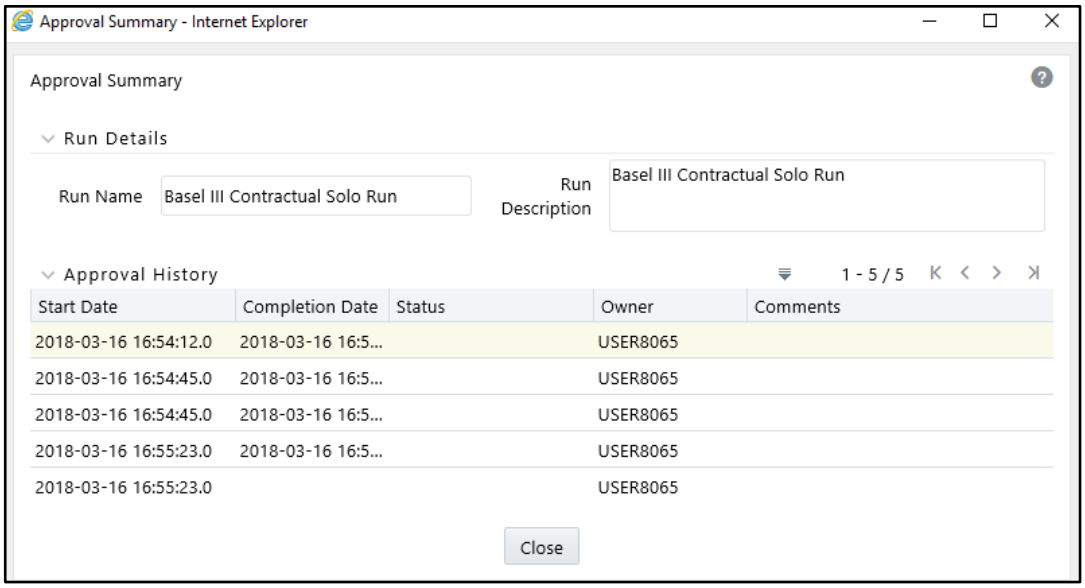



**Figure 43 Run Management – Approval Summary**

**Note**:

- The Approve or Reject buttons are present only for the users who have the right to approve or reject the definition.
- In case the definition is rejected, it changes back to ‘Open’ status. When the definition is in open status, click **View** to view the definition. You cannot edit the values in view window.
- Once the definition is approved, it cannot be edited in the case of Run definitions.

### 7.5.3 Retiring a Run definition

You can retire a Run definition when a definition is no longer valid and not required to be included in the selection of a new run calculation. To retire a definition once it is approved, perform the following steps:

To retire a definition, click  to select a definition from the list of Run definitions and then click  icon. The Run Definition window is displayed.

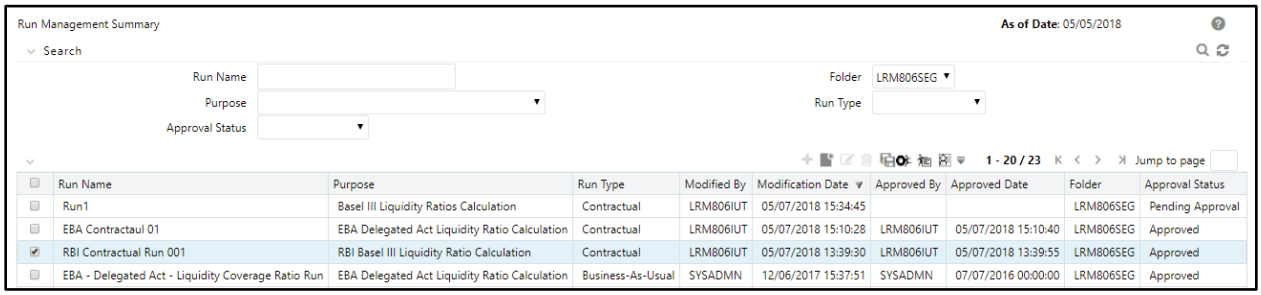



**Figure 44 Run Management Summary – Retire**

1. Click **Retire**. A retired definition will not be available for selection as part of a new Run definition.

**Note**:

- The approval status field in the Run Management Summary window allows you to search the pre-defined Run on the basis of approval status. This field displays a list of statuses that you have access to as a drop-down that is, Approved, Draft, In Review, Open, Pending Approval or Retired. Selection of a status from the drop-down list displays only those Run definitions that have been defined within the selected status in the Run Management Summary table.
- Assumption definitions can be approved only by those mapped to the LRM role who has defined the assumption. Multiple levels of approvals are supported.
- The Run definition, once saved and approved, is registered as a Rule in the Rules Framework of Oracle Financial Services Analytical Applications Infrastructure.

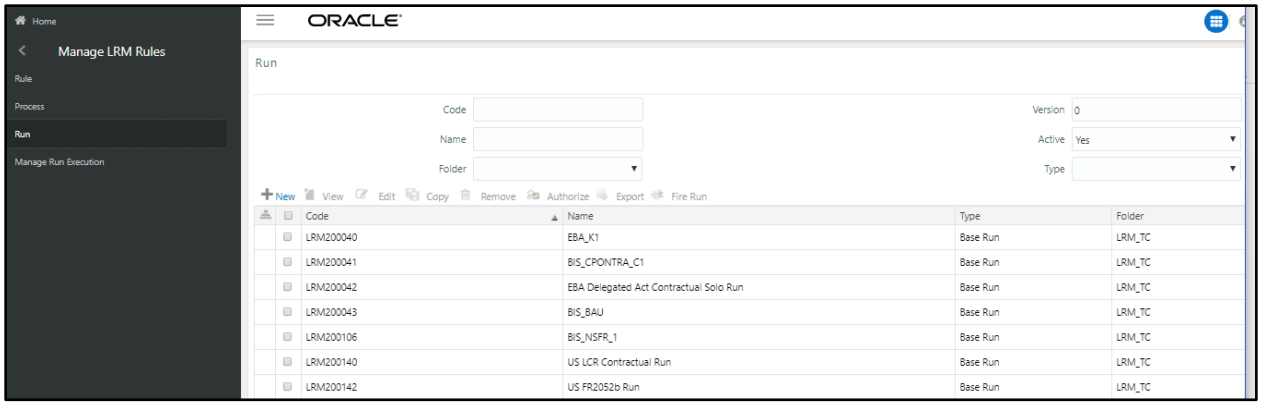
## 7.6 Adding a Custom Task to a Run

When a Run is defined from LRM Run Management window, it is also registered in the Run window of Rules Framework under the Oracle Financial Services Analytical Applications Infrastructure window.

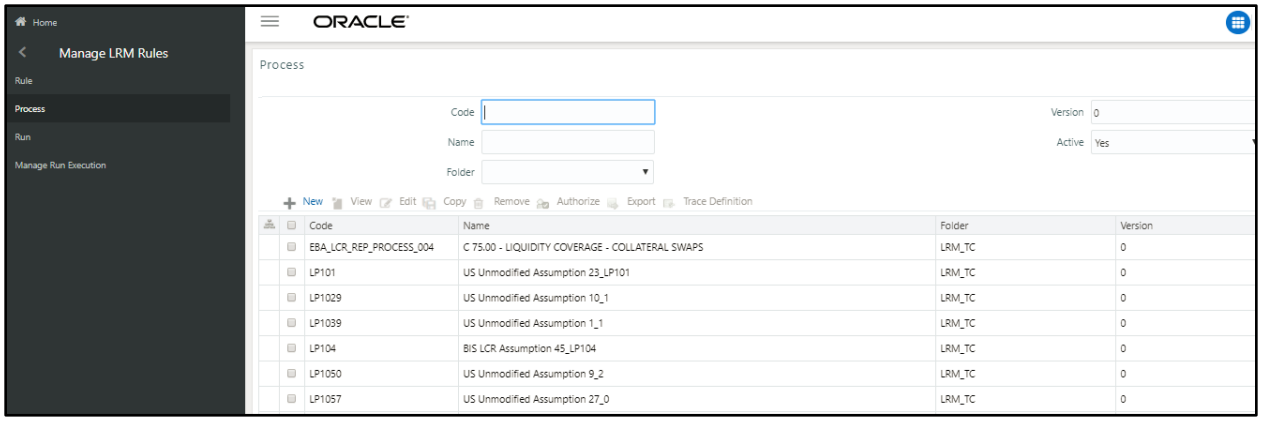
To add a task to a Run, perform the following steps:

1. On the Oracle Financial Services Analytical Applications Infrastructure home screen, select **Liquidity Risk Management** > **Manage LRM Rules** > **Run** on the LHS menu.

   On the RHS menu, you can view all the processes which are used and the tasks in the process. You can decide which process needs an additional custom task.

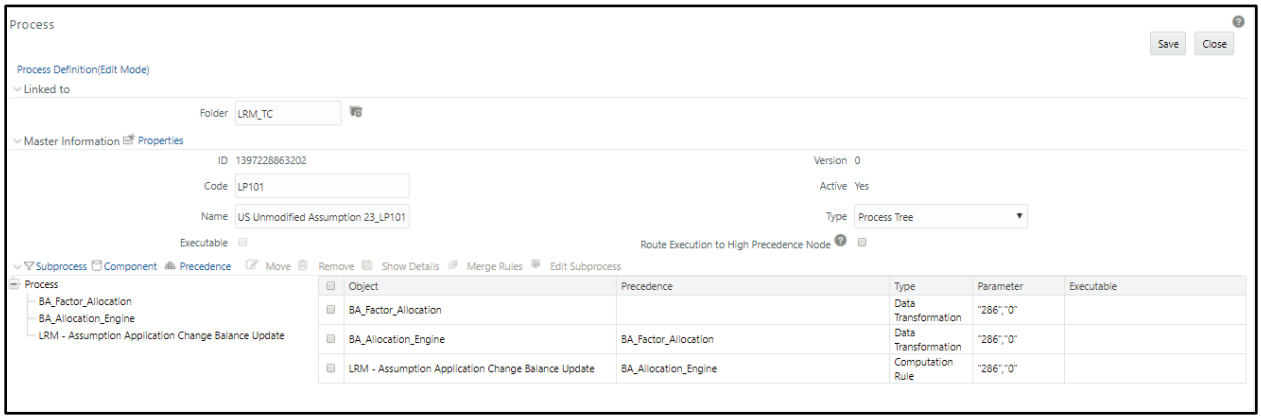



2. Choose **Manage LRM Rules** > **Process** on the LHS menu.




3. Select the process you wish to edit and then click Edit icon.

   The **Process** window is displayed.




4. In the process window, you can add a Custom Task. For more information on how to add a task to the process refer Edit Process Definition section in OFSAAI User Guide.

5. Click Save. Ensure to save it to the existing version.

   **Note**:

- Only Process can be edited and this is a custom change which may get overwritten when subsequent product patches are applied. Run must not be edited from RRF window if it is created through OFS LRM Run Management window.
- You can make the required edits to additionally include custom task. For more information refer *OFSAAI User Guide*.
- To execute this Run, you must go to Run Management window of LRM. The Run must be approved prior to execution.

## 7.7 Preparing for Execution

This chapter aims to detail the important activities that you must perform before executing Contractual, Business As Usual (BAU) or Stress Runs. It aims to provide details on the data required to be populated in the LRM Application and the steps to be followed to define business assumptions which will help identify liquidity gaps.

### 7.7.1 Data Requirements

Configuring data into the LRM Application is the basic and most important activity to commence working on the LRM Application. Data to be configured in the LRM Application can be divided into three types:

1. Setup Role Management
2. Setup Data Management
3. Run Data Management

Under Setup Role Management, you are requested to create specific roles to access the respective functionality of the screens and map these roles to user groups.

Setup data is a set of dimension tables which does not change frequently and can be categorized as a onetime setup activity required to be populated in OFS LRM.

Run or Execution data management details the staging data to be populated that change with each execution.

### 7.7.2 Data Quality Checks

In order to maintain the integrity and accuracy of the data populated into the OFS LRM application, certain data quality checks have been pre-configured under the Data Quality Framework link in OFSAAI.

For information on out-of-box Data Quality checks, refer the following LRM DQ Checks excel sheet:

LRM_DQ_Checks.xls

For more information, refer *OFS Analytical Applications Infrastructure User Guide* section 'DQ framework usage' on OHC Documentation Library.

### 7.7.3 Defining Time Buckets

After configuring setup data and Run or staging data in the LRM Application, the next step is to define the time buckets. Time Buckets can be defined by you in the Time Bucket Definition window of the LRM Application. Refer section Time Buckets for more information.

### 7.7.4 Dimension Maintenance

Before executing Runs as part of dimension maintenance, you must execute the <INFODOM>_SCD_COMPONENT and <INFODOM>_DimAccountPop batch. Refer *OFS Liquidity Risk Management V8.0.6.0.0 Run Chart* for more information on the batch.

Further some of the staging data which moves to processing area on MIS date basis have to be executed through ICC batches. Refer *OFS Liquidity Risk Management V8.0.6.0.0* Run Chart for further details.

**NOTE:** If ALM-LRM is integrated, then you must execute only one batch either, **<INFODOM>_DIMENSION_ACCOUNTS** at **ALM** or **<INFODOM>_DIMACCOUNTPOP** at **LRM**.

### 7.7.5 Defining Business Assumptions

After configuring setup data and dimension maintenance as well as defining time buckets in the LRM Application, the next step is to define the parameters of the business assumption before executing a Run. Business Assumptions can be defined by you in the Business Assumptions Definition window of the LRM Application. Refer section Business Assumptions for more information.

## 7.8 Run Execution Parameters

In the **Run Management Summary** window, select a Run from the list of Runs and click  icon. The **Run Execution Parameters** window appears.

The Run Execution Parameters window has the following sections:

- Linked To
- Run Definition Details
- Run Parameters
- Legal Entity Selection
- Run Execution Parameters

### 7.8.1 Linked To

This field displays the information about Linked To, which is selected as part of Run definition window. The details are displayed as follows:

- **Folder**: The folder which is specific to the Run definition.
- **Access Type**: Read/Write or Read Only is selected.

### 7.8.2 Run Definition Details

This section displays the details which have already been specified for the selected Run as part of Run Definition window. These details are not allowed to be edited. The details are displayed as follows:

- **Run Name**: Displays the Run name.
- **Run Description**: Displays the Run description.

### 7.8.3 Run Parameters

This section displays the parameters which have already been specified for the selected Run as part of Run Definition window. These parameters are not allowed to be edited. The parameters displayed include:

- Purpose
- Run Type
- Contractual Run (only in case of a Business-as-Usual Run)
- Baseline Run (only in case of Stress Run)
- Time Bucket Definition
- Consolidation Type
- Legal Entity Consolidation Legal Entity Consolidation Level Payment System Consolidation Type (only when the purpose is selected as Intra-Day Metrics Calculation)
- Business Day Convention
- Include Interest Cash Flows
- Approximate Interest
- Forward Rate Interpolation Method
- Assumptions Applied To (only in case of Business-as-Usual and Stress Run)

### 7.8.4 Legal Entity Selection

This section displays the Legal Entity Selection which is selected as part of Run definition window.

### 7.8.5 Run Execution Parameters

The Run execution parameters have to be specified for the selected Run.

#### 7.8.5.1 As of Date

This is a selection of a date from the calendar. The As of Date is with reference to the date of the input data required for computations. This is different from the execution date. The data available in the staging area which has a date corresponding to the As of Date is used for computations.

#### 7.8.5.2 Run Execution Description

This field allows you to provide a brief description of the Run execution. It is optional.

#### 7.8.5.3 Contractual Run Execution ID

When the Run type is selected as Business-As-Usual or Stress Run, execution ID of the underlying contractual Run is required to be selected from the Contractual Run Execution ID browser in the Run Execution Parameters window. Business assumptions, both BAU and stress, are applied to the cash flows aggregated as part of the selected contractual Run execution and further computations are carried out based on these aggregated cash flows and other interim metrics.

#### 7.8.5.4 Reporting Currency

When the Run type is selected as Contractual, Reporting Currency is allowed for selection from the browser in Run Execution Parameters window.

When the Run type is selected as Business-As-Usual, this field displays the reporting currency selected as part of the Contractual Run execution.

When the Run type is selected as Stress Run, this field displays the reporting currency selected as part of the Contractual Run execution.

For the first execution of a run, you must select the reporting currency. For subsequent executions the previously executed reporting currency, is automatically displayed but can be edited for each execution.

All the cash flows and balances in natural currency are converted to the reporting currency selected as part of this section for the purpose of computation and reporting. Additionally, the application also supports conversion to local currency of each legal entity in a single Run execution.

#### 7.8.5.5 Exchange Rate Source

This field allows you to select the source from which the exchange rate is obtained.

When the Run type is selected as Contractual, exchange rate source is allowed for selection from the drop-down in Run Execution Parameters window. The selection is as follows:

- Bloomberg
- Internal
- Reuters

If you have different exchange rates, perform the following steps to add a new exchange rate source:

1. Add a LOOKUP_CD in the table FSI_LRM_LOOKUP_B for the CATEGORY_ID = 19 (Exchange Rate Source).
2. Add a description for LOOKUP_CD added in the above mentioned table(FSI_LRM_LOOKUP_B) in the table FSI_LRM_LOOKUP_TL.

When the Run type is selected as Business-As-Usual or Stress Run, this field displays the reporting currency selected as part of the Contractual Run execution.

#### 7.8.5.6 LCR Horizon

This field allows you to enter the LCR Horizon (in days) for the purpose of liquidity coverage ratio calculation. By default this value is displayed is 30, which is the regulatory horizon for LCR. This can be edited. This parameter determines the number of days to which the LCR scenario applies i.e. net cash outflows will be calculated.

When the Run type is selected as Business-As-Usual or Stress Run, this field displays the LCR Horizon selected as part of the Contractual Run execution.

**Note**:

- You have the option of defining and executing any number of Runs.
- A Run can be executed multiple times for the same execution date.
- You also have the option of re-executing the same Run for different execution dates.

#### 7.8.5.7 Buffer Horizon

This field allows you to enter the Buffer Horizon (in days) for the purpose Regulation YY Liquidity Risk Calculation. By default this value is displayed is 30, which is the regulatory horizon for LCR. This can be edited.

#### 7.8.5.8 Stress Horizons

This field allows you to enter the Stress Horizons (in days) for the purpose Regulation YY Liquidity Risk Calculation. The application provides the 4 stress horizons specified by the

regulator i.e. 0, 30, 90 and 360 days pre-configured for selection by the user. Additionally, users can add multiple horizons which will be stored by the application for subsequent selection as well. This can be done based on the parameters Days and Multiplier.

Days – This field allows you to specify the width of the horizon. A value of 10 indicates a 10-day width.

Multiplier – This field allows you to specify the number of horizons of a particular width to be included. A value of 2, in conjunction with a day value of 10, means that 2 horizons, 10 day and 20 day, will be added to the horizon list.

**Note:**

- When only days are provided without having a multiplier specified, then the particular day is added to the pre-configured list as a single horizon value (in the above example, 10 day is added.)
- If multiplier is provided along with days, then application updates the list with the records equal to the multiplier and width equal to the days specified. For instance Days = 15, Multiplier = 4 will result in 4 horizons each with a width of 15 days, that is, 15, 30, 45, 60. However, in this instance, since the value 30 is already seeded, only the remaining 3 horizons are added.
- When you click + button, it adds the horizons to the list available in the drop down with the check box selected and also in the stress horizons field.
- When you click button, it resets the Days and Multiple fields.

## 7.9 Executing a Run

The LRM application contains a Run Management window, which contains the functionality of executing Runs, by selecting different Run level parameters for each execution. Runs can be defined in the Run framework of OFSAAI. Run execution is allowed through the Run Management window.

A Run can be executed as a solo Run or a consolidation Run.

Once a Run has been defined and approved, you can execute a Run by providing the Run execution parameters. You can perform an Ad Hoc execution or batch execution. For an Ad Hoc execution from the Run Execution window you can provide the parameters and click Execute. For a batch execution you can provide the parameters and click Create Batch. This creates a batch and you must schedule the batch scheduler module which is available in OFSAAI.

**NOTE:** If you are not executing the Run for the first time, then the parameters in the Run Parameters Link will be the same as the one selected for the previous Run.

You have the option of defining and executing any number of Runs. For each Run defined, you can select all or few assumptions to be applied to the Run. You also have the option of re-executing the same Run for different Execution dates.

### 7.9.1.1 Executing a Contractual Run

To execute a Contractual Run, perform the following steps:

1. Click **Run Management** on the LHS menu of the LRM Application to open the **Run Management Summary** window.
2. Click to select a contractual Run from the list of Runs and click icon.

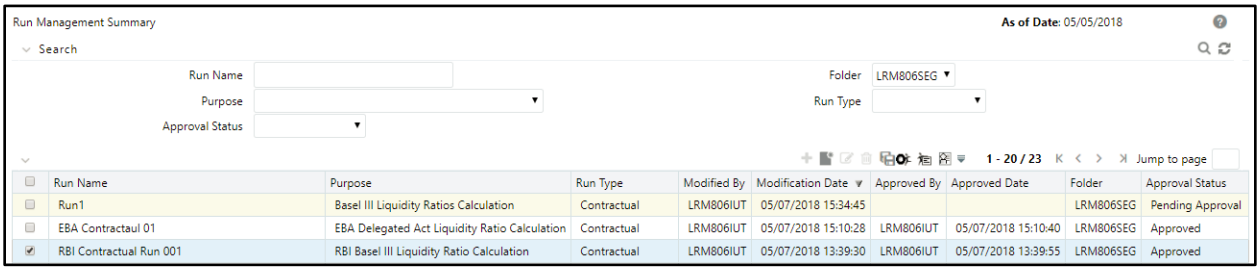



**Figure 45 Run Management Summary**

**Note**: All fields except for Run execution parameters are non-editable fields for the selected Run.

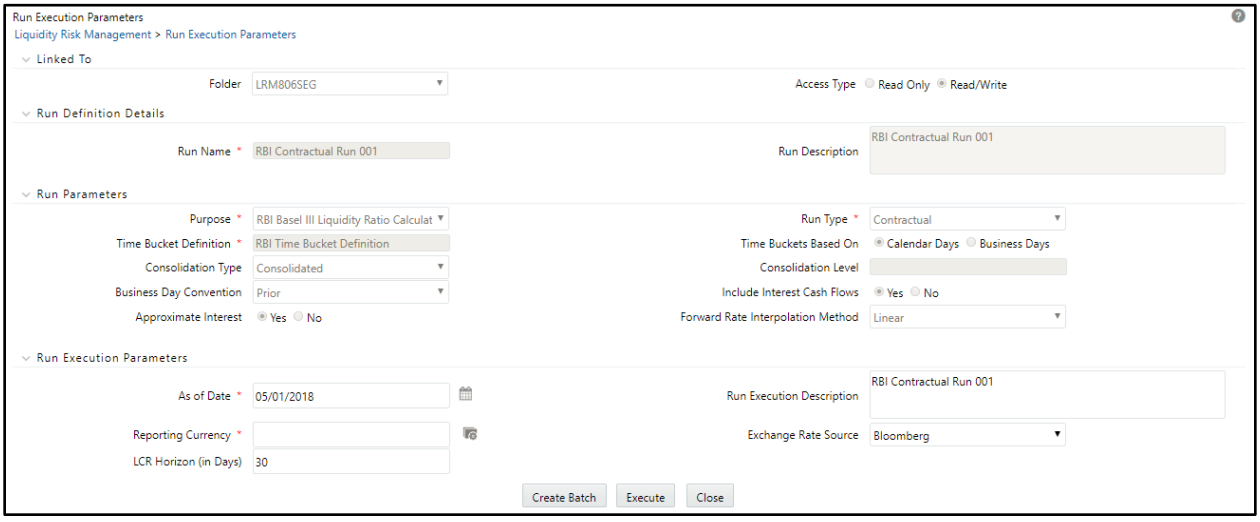



**Figure 46 Run Execution Parameters**

3. When the Run type is selected as **Contractual** and the purpose is selected **as Basel III Liquidity Ratios Calculation** or **Long Term Gap Calculation** or **U.S Fed Liquidity Ratio Calculation**, in the Run Execution Parameters section,
   a. Click to select the **As of Date**.
   b. Enter the **Run Execution Description**.
   c. Click to select the **Reporting Currency** from the Hierarchy Browser and then click **OK**. Only a single selection is allowed here.

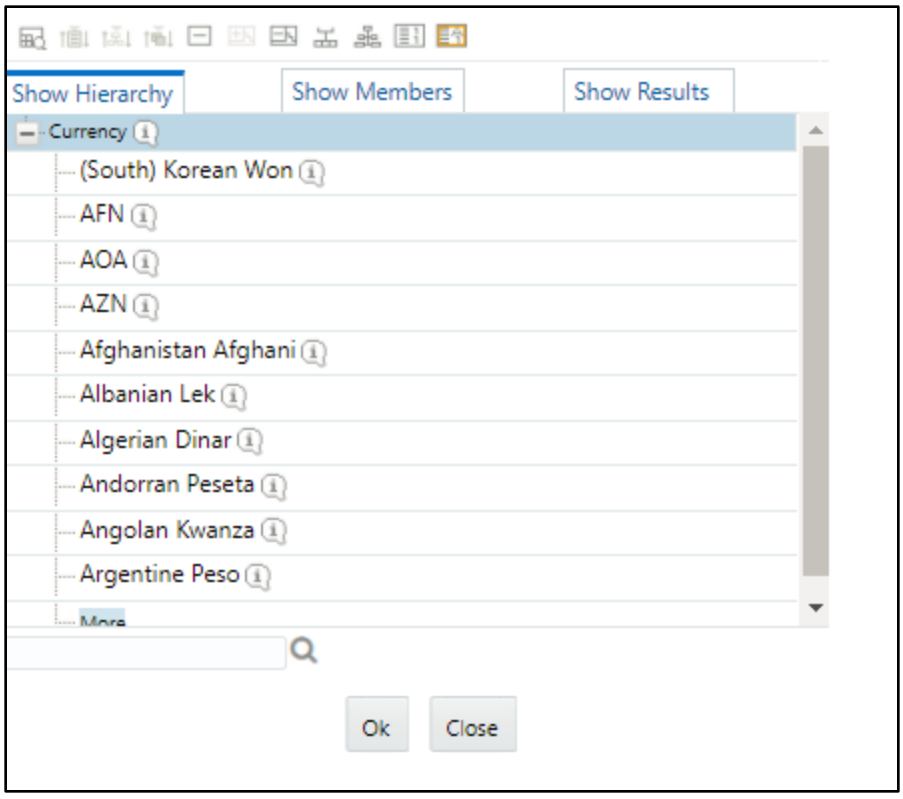



**Figure 47 Run Definition – Hierarchy Browser**

d. Select the **Exchange Rate Source** from the drop-down list.

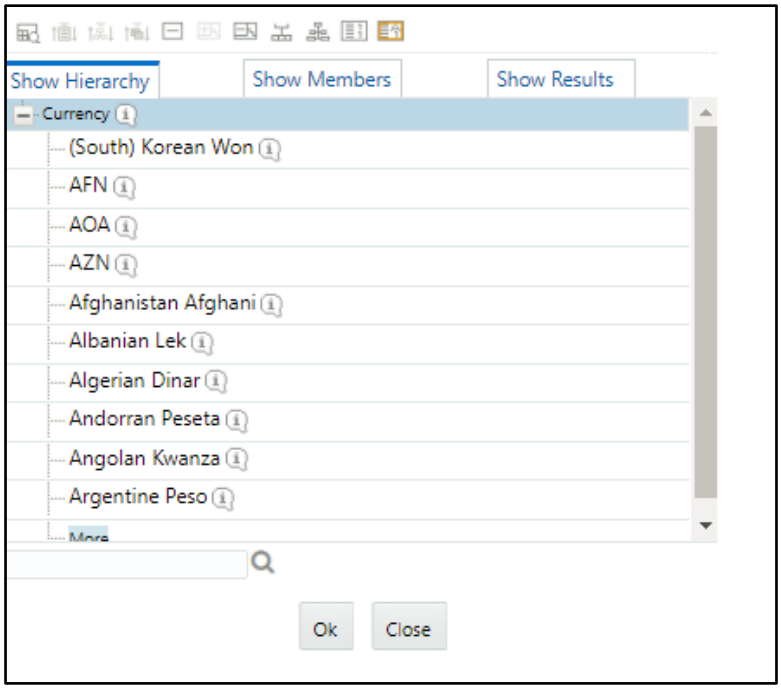
e. Enter the **LCR Horizon (in days)**. The default value is 30. This applicable only when the purpose is selected as Basel III Liquidity Ratios Calculation or U.S Fed Liquidity Ratio Calculation.

4. When the Run type is selected as **Contractual** and the purpose is selected as **FR 2052 a Report Generation** or **FR 2052 b Report Generation**, in the Run Execution Parameters section,

A. Click to select the **As of Date**.

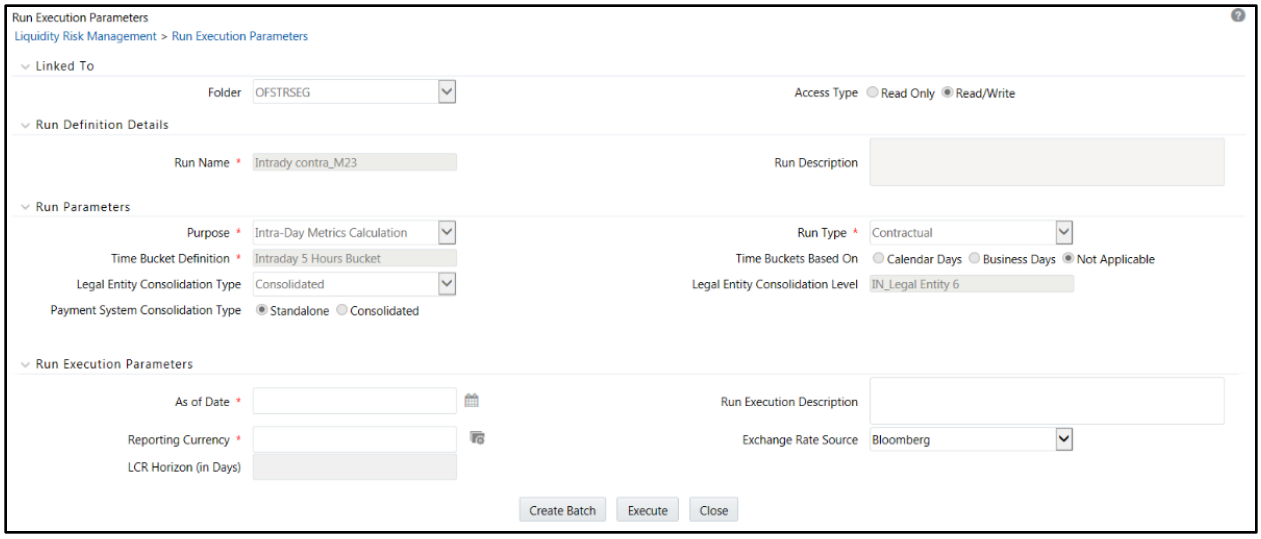
B. Enter the **Run Execution Description**.

C. Click to select the **Reporting Currency** from the Hierarchy Browser and then click **OK**.




D. Select the **Exchange Rate Source** from the drop-down list.

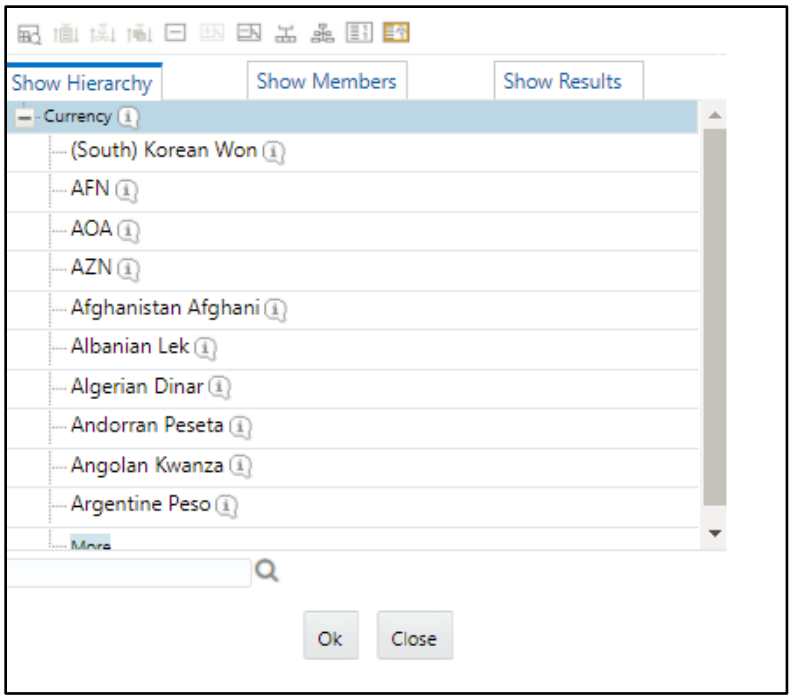
5. When the Run type is selected as **Contractual** and the purpose is selected as **Intra-Day Metrics Calculation**, in the Run Execution Parameters section:




A. Click  to select the **As of Date**.

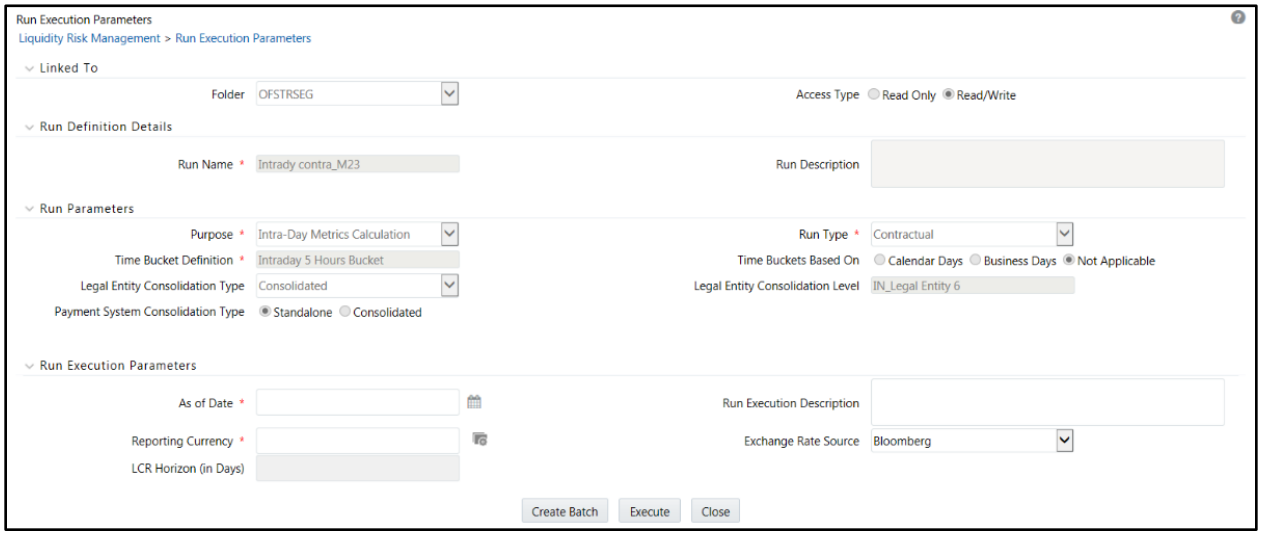
B. Enter the **Run Execution Description**.

C. Click  to select the **Reporting Currency** from the Hierarchy Browser and then click **OK**.




D. Select the **Exchange Rate Source** from the drop-down list.

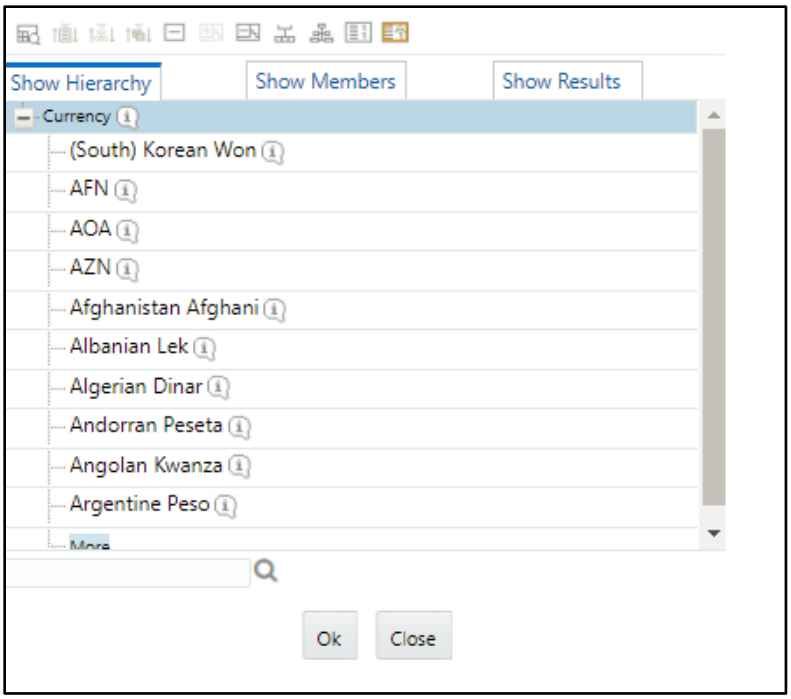
6. When the Run type is selected as **Contractual** and the purpose is selected as **Regulation YY Liquidity Risk Calculation**, in the Run Execution Parameters section:




A. Click  to select the **As of Date**.

B. Enter the **Run Execution Description**.

C. Click  to select the **Reporting Currency** from the Hierarchy Browser and then click **OK**.




D. Select the **Exchange Rate Source** from the drop-down list.

E. Enter the **Buffer Horizon** value in days.

F. Enter the **Stress Horizon** value or click to select from the available options. This field allows you to specify the value in terms of days and allows multiple horizons to be provided as an input.

7. Execute the Run as per one of the following methods:

   Click **Create Batch** to create batches for execution from the batch execution window.

   Or,

   Click **Execute** to execute the Run from the Run Execution Parameters window itself

   Click **Close** to return to the Run Management Summary window.

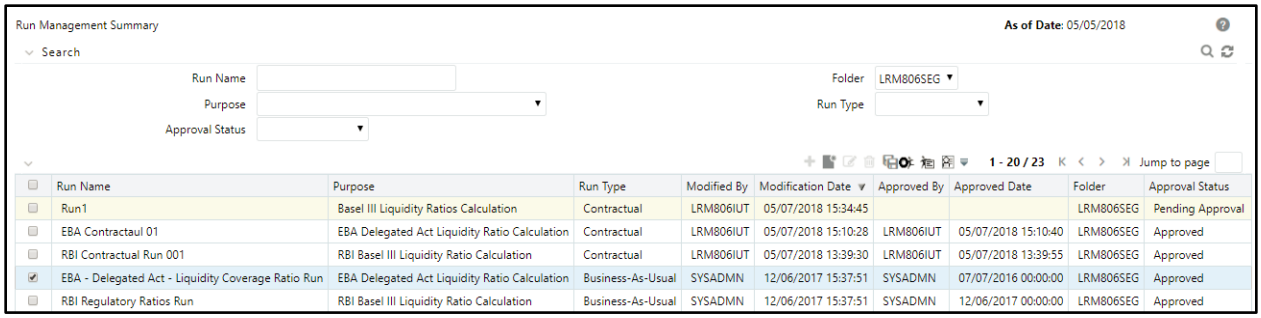
   **Note**:

   Run Execution Parameter Definition does not have an approval process.

#### 7.9.1.2 Executing a BAU Run

To execute a BAU Run, perform the following steps:

1. Click **Run Management** on the LHS menu of the LRM Application to open the **Run Management Summary** window.
2. Click to select a BAU Run from the list of Runs and click icon.




The **Run Execution Parameters** window appears. Here, the parameters of the Run are displayed in an un-editable form and the execution parameters are allowed to be specified for the selected Run.

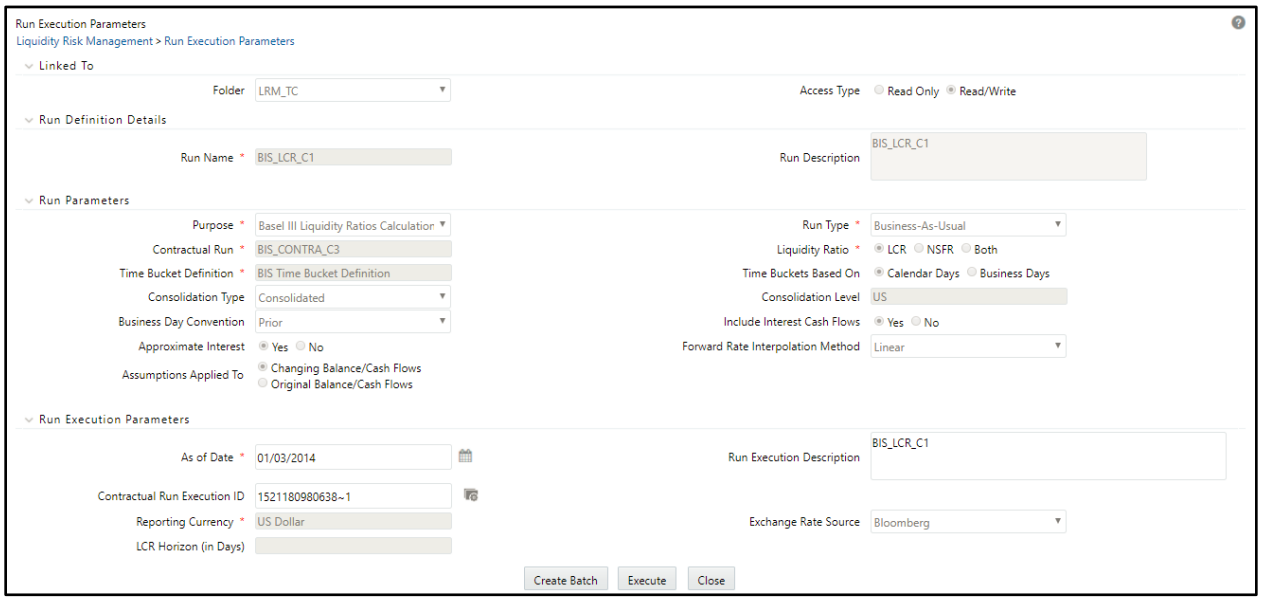



**Figure 48 Run Definition – Run Execution Parameters**

3. When the Run type is selected as **Business-As-Usual** and the purpose is selected as **Basel III Liquidity Ratios Calculation** or **Long Term Gap Calculation** or **U.S Fed Liquidity Ratio Calculation**, in the **Run Execution Parameters** section,

   a. Click  to select the **As of Date**.

   b. Enter the **Run Execution Description**.

   c. Click  to select the **Contractual Run Execution ID** from the browser and then click **OK**. This is the execution ID of the underlying Contractual Run.

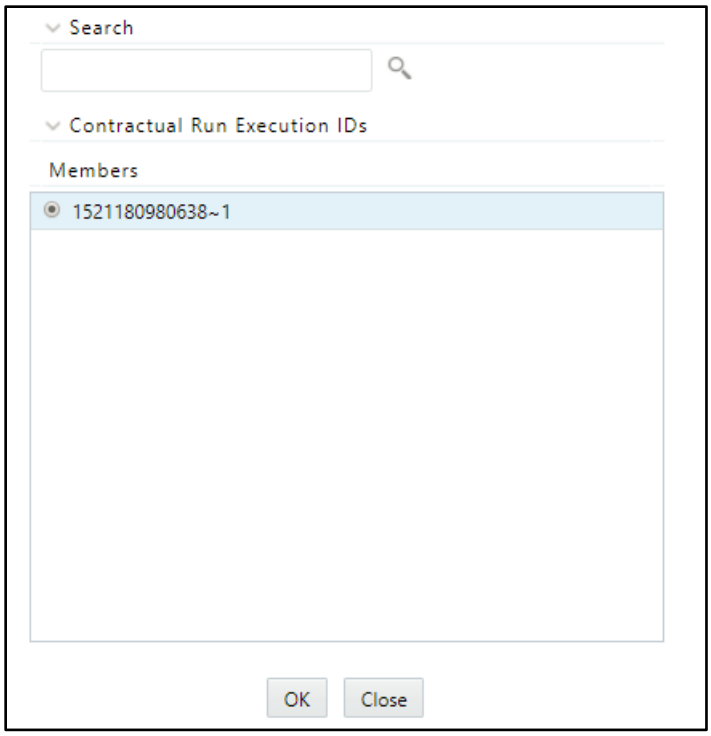



**Figure 49 Contractual Run Execution ID Browser**

d. **Reporting Currency**, **Exchange Rate Source** and **LCR Horizon** fields are disabled and display the values which are selected as part of the contractual Run execution.

**Note**:

- Except for business assumptions which are selected as part of the Run parameters all other Run parameters are displayed.
- Run Execution Parameter Definition does not have an approval process.

4. Execute the Run as per one of the following methods:

   Click **Create Batch** to create batches for execution from the batch execution window.

   Or,

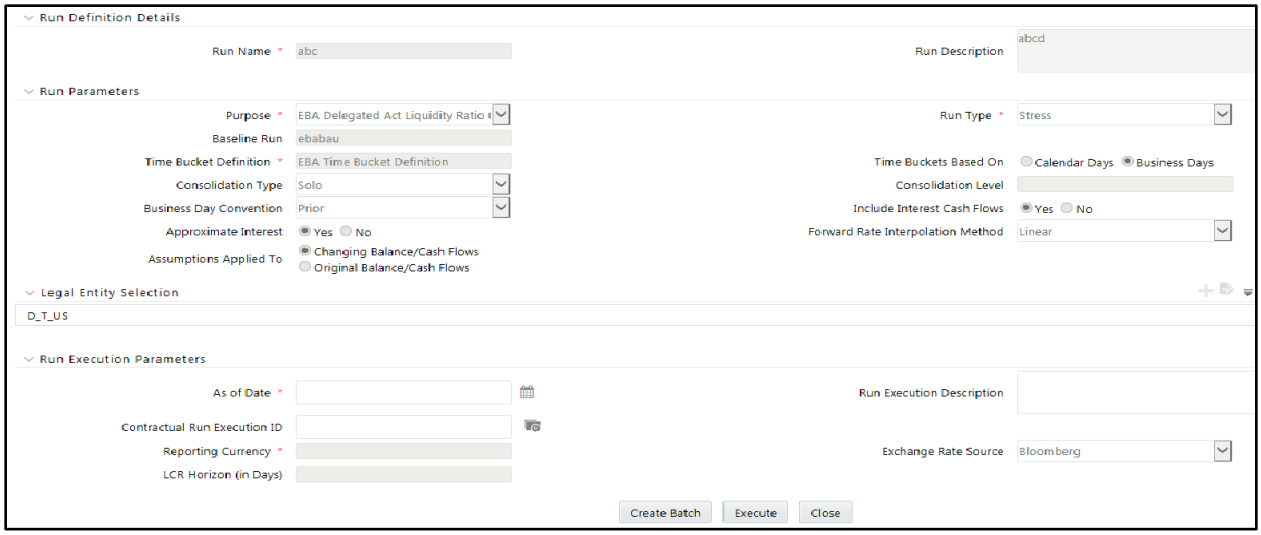
   Click **Execute** to execute the Run from the Run Execution Parameters window itself

5. Click **Close** to return to the Run Management Summary window.

#### 7.9.1.3 Executing a Stress Run

To execute a Stress Run, perform the following steps:

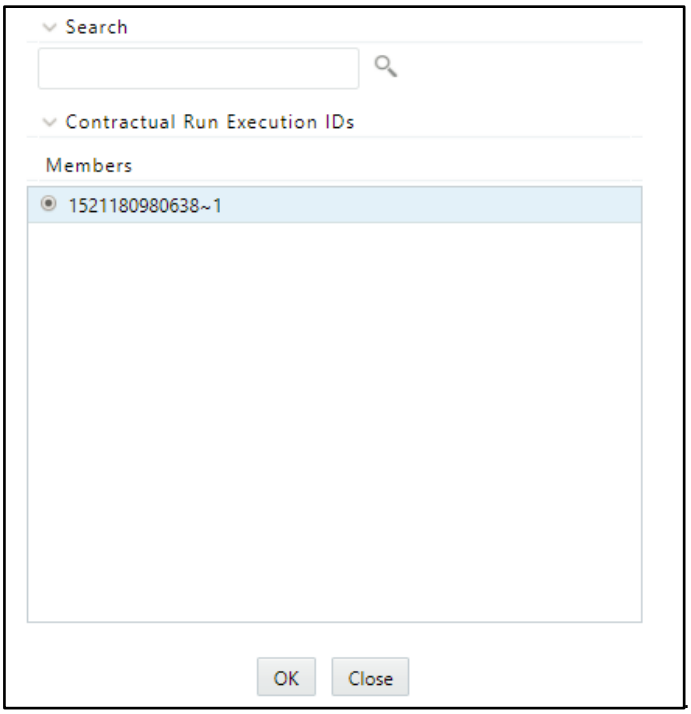
1. Click **Run Management** on the LHS menu of the LRM Application to open the **Run Management Summary** window.
2. Click  to select a Stress Run from the list of Runs and click  icon.




3. All the fields are same as explained for Contractual and BAU Runs. The only exception is that a stress Run is based on a Business as usual Run. All the parameters specified as part of the Run execution parameter window are displayed in an un-editable form. This is based on the selection of the BAU Run. There is a direct mapping between a BAU and a Stress definition in the stress testing framework.
4. For Intraday Stress execution, perform the following steps:

   **Note**: Intraday Stress Run is based on Intraday Contractual Run.

   a. Click to select the **As of Date**.
   b. Enter the **Run Execution Description**.
   c. Click to select the **Contractual Run Execution ID** from the browser and then click **OK**. This is the execution ID of the underlying Contractual Run.




The application prompts you to enter the Contractual Run Execution ID if you fail to enter these details.

6. Execute the Run as per one of the following methods:

   Click **Create Batch** to create batches for execution from the batch execution window.

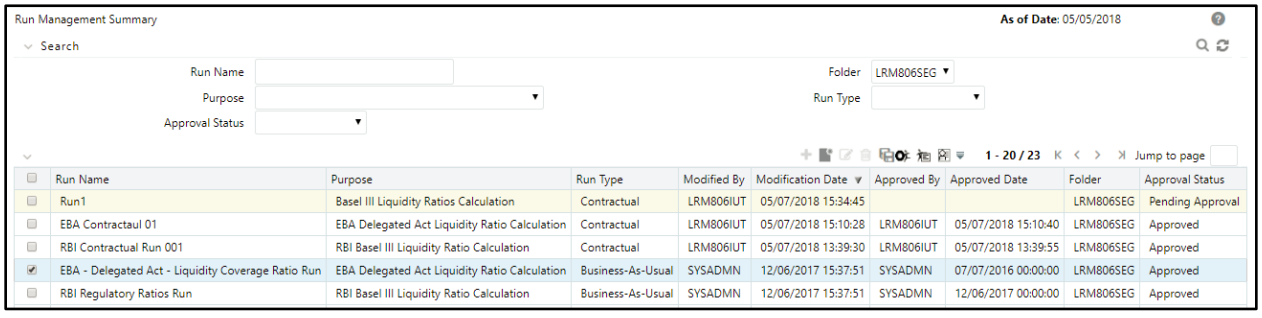
   Or,

   Click **Execute** to execute the Run from the Run Execution Parameters window itself

5. Click **Close** to return to the Run Management Summary window.

## 7.10 Run Execution Summary

To view the summary of all the Run executions of a particular Run, click to select a Run from the list of Runs in the Run Management Summary window and click icon.




The Run execution summary is displayed as follows:

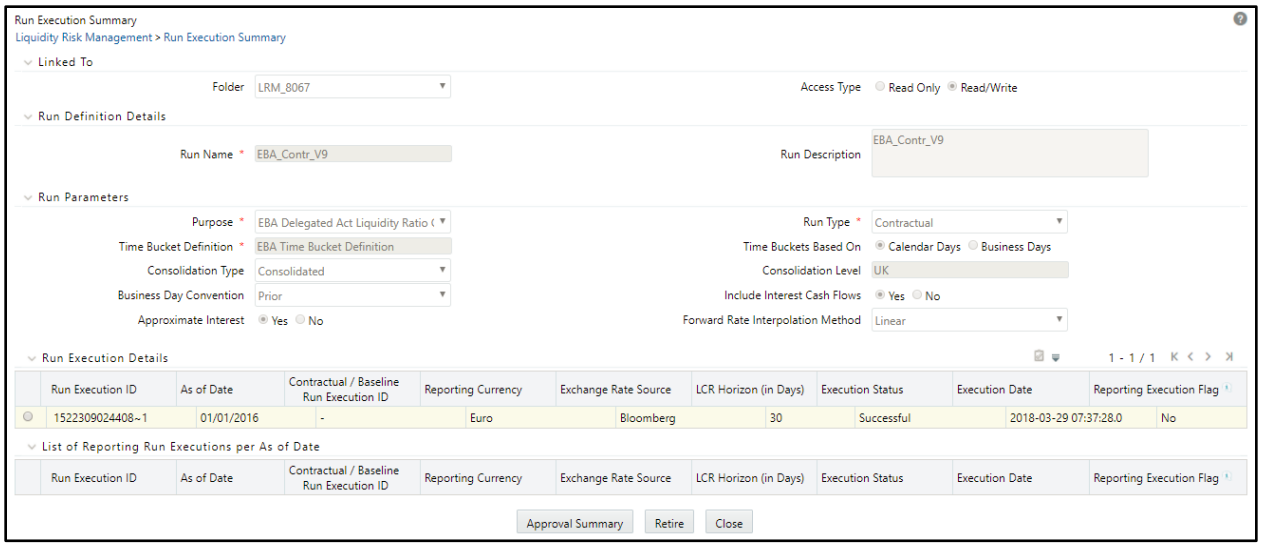
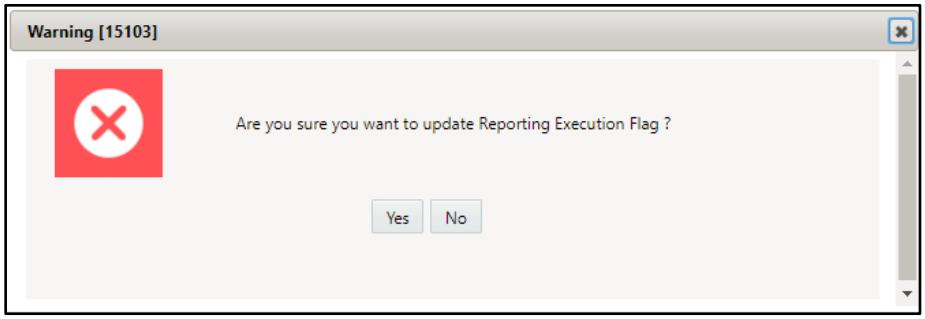



**Figure 50 Run Execution Summary**

1. All the parameters entered as part of the Run Definition window are displayed in an un-editable form.
2. Run Execution Details section displays the Run execution parameters specified for each execution.
    a. You can select a successful Run Execution ID and click  **Reporting Execution Flag** icon to report it for execution.
    b. A confirmation message appears before updating the Reporting flag.




    c. Click **Yes**. This Run ID is now listed in the List of Reporting Run Execution per As of Date section.
    d. When you select a Run execution which has failed,  **Reporting Execution Flag** icon is disabled.
3. List of Reporting Run Execution per As of Date section displays the Run execution parameters which are reported for execution.

4. Business assumptions section displays the details of the business assumptions selected as part of each Run. This is applicable only in case of a Business-as-Usual or Stress Run. The details are displayed in a tabular format in the Business assumption section is as follows:

    a. **Assumption Name**: This column displays the name of the business assumption selected as part of the Run.

    b. **Version Number**: This column displays the version number of the BAU or stress assumption that was used for computations as part of the selected Run execution. Click the version number to launch the Business Assumption Definition window that displays the specific version of the selected business assumption.

    c. **Assumption Category**: This column displays the assumption category selected as part of the Run.

    Additionally for Stress Run, the following fields are displayed:

    a. **Stress Assumption Name**: This column displays the name of the stress assumption selected as part of the Run.

    b. **Stress Version Number**: This column displays the version number of the BAU or stress assumption that was used for computations as part of the selected Run execution. Click the version number to launch the Business Assumption Definition window that displays the specific version of the selected business assumption.

    c. **Stress Assumption Category**: This column displays the stress assumption category selected as part of the Run.

    d. **Time Bucket Definition Validation**: This column checks and displays if the Time Bucket Definition under Run Parameters section and the Time Bucket Definition under Business Assumptions section in Run Definition match.

Refer section Approving a Run Definition to know how to retire a definition and view the approval summary.

# 8 Counterbalancing Strategies

## 8.1 Overview

The Counterbalancing Strategy module of Oracle Financial Services Liquidity Risk Management aids banks in developing contingency funding plans to address the liquidity hotspots observed during stress scenarios of varying magnitudes. A counterbalancing strategy or a contingency funding plan refers to certain measures undertaken by banks to minimize or nullify the gaps identified under the BAU and Stress conditions. The purpose is to identify the large negative and positive liquidity gaps across defined time buckets and apply counterbalancing actions that will reduce the gaps.

A range of counterbalancing strategies, consisting of one or multiple counterbalancing positions covering the fire sale of marketable and fixed assets, creation of new repos, rollover of existing repos and raising fresh deposits or borrowings, can be defined easily in order to bridge the liquidity gaps observed under different business conditions. This module enables banks to dynamically assess and update their contingency funding plans based on the changing market and business conditions thereby ensuring complete preparedness to combat potential liquidity shocks.

The OFS LRM application, gives you the option of applying five different types of counterbalancing positions to generate new cash flows and manage huge negative and positive liquidity gaps. These include:

- Sale of Marketable Assets
- Sale of Other Assets
- Rollover of Existing Repo’s
- New Repo’s
- New Funding

The liquidity gaps and other metrics, calculated post counterbalancing, are displayed in the Liquidity Risk dashboard of ALM Analytics for each counterbalancing strategy definition.

**NOTE:**

Counterbalancing strategies are applied to the liquidity gap results of a specific execution of an existing contractual, business-as-usual or stress Run.

## 8.2 Counterbalancing Strategy Definition

The Counterbalancing Strategy Definition has the following sections for defining parameters:

- Details
- Liquidity Gap Report
- Counterbalancing Positions

### 8.2.1 Details

The following details must be specified for the counterbalancing strategy:

- **Counterbalancing Strategy Name**: Enter Counterbalancing Strategy Name.
- **Description**: Enter the description of the counterbalancing strategy.

The following details of a particular execution of the underlying Run to which the counterbalancing strategy is to be applied are selected.

- **FIC MIS Date**: Select the as of date of the Run to which the counterbalancing strategy is to be applied.
- **Run Type**: Select the type of Run on which you want to apply the counterbalancing strategy. Options available in the drop-down are Contractual, BAU and Stress.
- **Run Selection**: Select the Run to which the Counterbalancing Strategy needs to be executed.
- **Run Execution ID**: Select the Run execution ID of the selected Run to which counterbalancing strategy needs to be executed.
- **Currency**: Select the reporting currency or local currency as an option. This will be executed on the selected currency type over the selected Run.
- **Legal Entity**: Select the legal entity to which the counterbalancing strategy needs to be executed.

  **Note**: Data at the selected LE level only is displayed. This is applicable to LEs which have child entities as well.
- **Baseline Run**: Select the baseline Run to which the counterbalancing strategy needs to be executed. When you click the selection button, Run Selection Browser appears which will allow you to select the Run.
- **Time Bucket Level Selection**: Select the time bucket level selection to which the counterbalancing strategy needs to be executed.
- **Values to be shown in multiples of**: Click this dropdown to select to display the values in multiples of thousands, millions and billions.

### 8.2.2 Liquidity Gap Report

This section displays the following, Liquidity gaps calculated as part of the selected execution and Run selected at the time bucket levels which are in terms of multiples selected as part of the Details section.

It will be at selected level and value. It will either be in millions or billions or thousands based on your selection above. The Liquidity Gap report is generated once you click  button.

### 8.2.3 Counterbalancing Positions

This section allows you to add one or multiple counterbalancing positions, which together constitute a counterbalancing strategy. When you click the add + icon, the Counterbalancing Strategy Definition window is displayed where you can specify the counterbalancing positions to be applied.

Counterbalancing Strategy Definition window supports the following types of counterbalancing positions in the LRM Application:

- Sale of Marketable Assets:
- Sale of Other Assets
- Rollover of Existing Repos
- New Repos
- New Funding

#### 8.2.3.1 Sale of Marketable Assets

This counterbalancing position type allows you to sell a marketable instrument prior to its maturity. Sale of marketable assets generates new cash inflow in the sale bucket and reverses all original cash flows occurring between the sale bucket and maturity. Only unencumbered marketable assets (identified through encumbrance status and marketable asset indicator) are available for selection as a part of this counterbalancing strategy.

As part of this counterbalancing position, you are required to select a marketable instrument and provide the following sale parameters:

- **No. of Units / Percentage to be Sold**: This is the number of units or percentage of the instrument that is to be sold. This value has to be within the sale limit, if any, specified for the asset.
- **Discount (in %)**: This is the discount applied to the asset value to determine the inflows on sale.
- **Revised Inflow Bucket**: This is the sale bucket i.e. bucket where the cash inflows are generated due to the sale.

The cash flows on sale of marketable assets are calculated as follows:

1. Original maturity bucket and maturity amount of the asset is identified.
2. Cash inflows to be posted to the sale bucket are calculated as follows:

$$Cash\ Inflow_{Sale\ Bucket} = Market\ Value\ Per\ Unit \times Number\ of\ Units \times Sale\ Percentage \times (1 - Discount)$$

3. Original cash flows occurring from the sale bucket to the maturity bucket are reversed as follows:

$$Cash\ Outflow_{Time\ Bucket>Sale\ Bucket} = Original\ Cash\ Inflow \times Sale\ Percentage$$

**Note:**

- The units or amount available for sale depends on the sale limit specified for each instrument. For instance, if the total units of Bond A held by the legal entity are 100 and a sale limit of 50% is specified, then, only 50 units of Bond A are allowed to be sold while counterbalancing.
- If all the available units of an asset are sold then this asset will not appear in the Marketable Assets Browser for selection.
- In case of partial sale, only the balance units or amount are available for further counterbalancing actions including sale and repo. If an instrument is sold partially, it is allowed to be selected again for the purpose of sale provided the sale parameters differ i.e. a different haircut or sale bucket.

#### 8.2.3.2 Sale of Other Assets

This counterbalancing position type allows you to sell a non-marketable asset such as a fixed asset or an earning asset prior to its maturity. Sale of other assets generates new cash inflow in the sale bucket and reverses all original cash flows occurring between the sale bucket and maturity. Only unencumbered assets (identified through encumbrance status) are available for selection as a part of this counterbalancing strategy.

As part of this counterbalancing position, you are required to select a non-marketable asset and provide the following sale parameters:

- **Value of Assets to be Sold**: This is the percentage of the asset that is to be sold. This value has to be within the sale limit, if any, specified for the asset.
- **Discount (in %)**: This is the discount applied to the asset value to determine the inflows on sale.
- **Revised Inflow Bucket**: This is the sale bucket i.e. bucket where the cash inflows are generated due to the sale.

The cash flows on sale of other assets are calculated as follows:

1. Original maturity bucket and maturity amount of the asset is identified.
2. Cash inflows to be posted to the sale bucket are calculated as follows:

$$Cash\ Inflow_{Sale\ Bucket} = EOP\ Balance \times Sale\ Percentage \times (1 - Discount)$$

3. Original cash flows occurring from the sale bucket to the maturity bucket are reversed as follows:

$$Cash\ Outflow_{Time\ Bucket>Sale\ Bucket} = Original\ Cash\ Inflow \times Sale\ Percentage$$

**Note:**

- The sale of other assets includes loans and fixed assets. All assets of the banks excluding marketable assets are available for sale as part of this counterbalancing position.

- The amount available for sale depends on the sale limit that is specified. For example, if the total value of land held by the legal entity is $10000000 and a sale limit of 30% is specified, then the land worth of a maximum of $3000000 is allowed to be sold while counterbalancing.
- In case of partial sale, only the balance amount is available for further counterbalancing actions including sale and repo. If an asset is sold partially, it is allowed to be selected again for the purpose of sale provided the sale parameters differ i.e. a different haircut or sale bucket.

#### 8.2.3.3 Rollover of Existing Repos

This counterbalancing position type allows you to extend the maturity of an existing repo/reverse repo by rolling it over to a later time bucket. This results in rescheduling of cash outflows/inflows to a future date and reversal of cash outflows/inflows at the original maturity. This is applied at an individual instrument position level.

As part of this counterbalancing position, you are required to select an existing repo and provide the following rollover parameters:

- **Units to be Rolled Over**: This is the number of units of the underlying asset that are to be rolled over.
- **Revised Maturity Bucket**: This is the new maturity bucket post rollover. Revised maturity bucket should be less than or equal to the maturity bucket of the underlying instrument.
- **Haircut (in %)**: Provide the Haircut in %.

The cash flows on rollover of repos and similar instruments are calculated as follows:

1. Original maturity bucket and maturity amount of the repo is identified.
2. Original cash outflows occurring in the original maturity bucket are reversed:

$$\boldsymbol{Cash\ Inflow_{Original\ Maturity\ Bucket} = MTM\ Value \times Rollover\ Percentage \times (1 - Haircut)}$$

3. Cash outflows to be posted to the revised maturity bucket are calculated as follows:

$$\boldsymbol{Cash\ Outflow_{Revised\ Maturity\ Bucket} = MTM\ Value \times Rollover\ Units}$$

The cash flows on rollover of reverse repos and similar instruments are calculated as follows:

1. Original maturity bucket and maturity amount of the reverse repo is identified.
2. Original cash inflows occurring in the original maturity bucket are reversed:

$$\boldsymbol{Cash\ Outflow_{Original\ Maturity\ Bucket} = MTM\ Value \times Rollover\ Percentage \times (1 - Haircut)}$$

3. Cash inflows to be posted to the revised maturity bucket are calculated as follows:

$$\boldsymbol{Cash\ Inflow_{Revised\ Maturity\ Bucket} = MTM\ Value \times Rollover\ Units}$$

**Note:**

- Revised maturity bucket cannot exceed maturity bucket of underlying security.
- All repo like instruments are supported as part of this counterbalancing action including repo's, reverse repo's, buy/sell backs and sell/buy backs.

#### 8.2.3.4 New Repos

This counterbalancing position type allows you to create new repo transactions by selecting an existing asset. Creation of a new repo, results in a cash inflow on the repo start date and a corresponding outflow at the repo maturity date specified as part of the counterbalancing position. New repos can be created for the following types of marketable instruments:

- Unencumbered securities (identified through encumbrance status)
- Securities for which the bank has re-hypothecation rights (indicator for re-hypothecation rights)

As part of this counterbalancing position, you are required to select an existing repo and provide the following rollover parameters:

- **No of Units to be Repo'd**: This is the number of units of the asset to be repo'd.
- **Haircut (in %)**: This is the haircut applied to calculate the repo value.
- **Revised Inflow Bucket**: This is the bucket where the inflows from the repo are received and the asset is encumbered i.e. repo start bucket.
- **Revised Maturity Bucket**: This is the time bucket in which the repo contract matures i.e. where the asset is received and cash is paid to the counterparty.

The cash flows on repo creation are calculated as follows:

1. Cash inflows occurring in the repo start bucket are calculated as follows:

$$\boldsymbol{Cash\ Inflow_{Repo\ start\ Bucket} = MTM\ Value \times Units\ to\ be\ Repo'd \times (1 - Haircut)}$$

2. Cash outflows to be posted to the revised maturity bucket are user specified.
3. The underlying asset is encumbered i.e. encumbrance status is updated.

The cash flows on repo creation are calculated as follows:

1. Cash outflows occurring in the reverse repo start bucket are calculated as follows:

$$\boldsymbol{Cash\ Outflow_{Reverse\ Repo\ start\ Bucket} = MTM\ Value \times Units\ to\ be\ Repo'd \times (1 - Haircut)}$$

2. Cash inflows to be posted to the revised maturity bucket are user specified.

**Note:**

- Revised maturity bucket cannot exceed maturity bucket of underlying security.
- All repo like instruments are supported as part of this counterbalancing action including repo's, reverse repo's, buy/sell backs and sell/buy backs.
- The units of the asset available to be repo'd depend on the repo limit that is specified. For instance, if the total units of Bond A held by a legal entity are 100 and a repo limit of 40% is specified, then only 40 units of Bond A are allowed to be repo'd while counterbalancing.
- If all available units of an asset are repo'd then it does not appear for selection in the Marketable Assets Browser.

- In case of partial repo, only the balance units/amount appears in the Units Available column for further counterbalancing actions (e.g. sale of marketable assets). If only some units of an instrument are repo'd, then it can be selected again for the purpose of repo provided the repo parameters differ (e.g. with a different haircut or time bucket).
- Exposure to an existing counterparty while creating new repos is allowed only up to the counterparty limit specified. For instance if the counterparty limit is specified as 1 Million for Counterparty X, the current exposure is 900000, then creation of new repo's is allowed only up to an exposure of 100000 against Counterparty X.

#### 8.2.3.5 New Funding

This counterbalancing position type allows you to raise new funding either as a deposit or borrowing. A new funding creates a cash inflow in the specified time bucket and a corresponding outflow in a later time bucket. The LRM application allows you to specify the product, borrowing date (inflow date), borrowed amount, maturity date and amount.

As part of this counterbalancing position, you are required to select a funding product and provide the following parameters:

- **Legal Entity**: This is the legal entity which is raising the new funding in context of the counterbalancing position.
- **Line of Business**: This is the line of business of the legal entity which is raising the new funding.
- **Natural Currency**: This is the natural currency of the new deposit or borrowing account.
- **Counterparty**: This is the counterparty who is deemed to have provided the new funding.
- **Inflow Bucket**: This is the transaction start bucket that is, the bucket in which the inflows from the new deposit or borrowing is recorded.
- **Inflow Amount**: This is the cash received from the new funding.
- **Maturity Bucket**: This is the maturity bucket of the transaction that is, the bucket in which cash outflows is recorded.
- **Maturity Amount**: This is the outflow amount at the maturity of the new funding.

**NOTE:** The cash flows do not have any calculations. It posts the inflows and outflows amount as provided by you.

### 8.2.4 Liquidity Gap Report Post Counterbalancing

This section displays the Post Counterbalancing Gap Report of the selected Run. Once all counterbalancing positions are defined, clicking the Apply Counterbalancing button triggers the calculation of changes to cash flow position due to the counterbalancing strategy. The effect of

counterbalancing positions on the baseline liquidity gaps is displayed in a tabular format. The counterbalancing strategy is allowed to be edited and its effect can be re-calculated within the application.

## 8.3 Understanding Counterbalancing Strategy Summary

In the **Oracle Financial Services Analytical Applications Infrastructure** home screen select, **Financial Services Liquidity Risk Management**.

To open the **Counter Balancing Strategy** window, choose **Liquidity Risk Management** > **Counter Balancing Strategy** on the Left-Hand Side (LHS) menu.

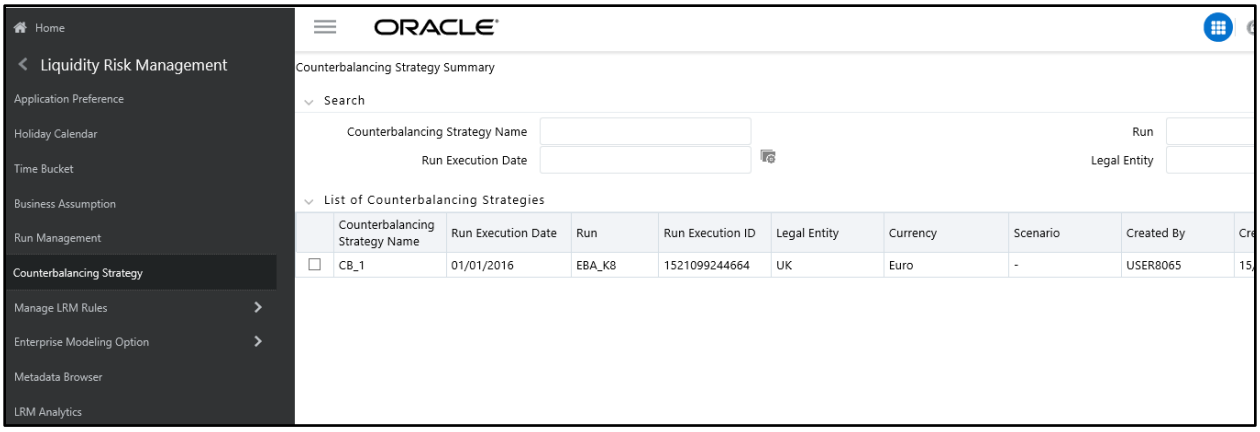



**Figure 51 Counterbalancing Strategies Summary**

The Counterbalancing Strategies Summary window of the LRM application allows you to define/execute a Counterbalancing Strategy in the LRM Application.

This is the search section which contains multiple parameters. You can specify one or multiple search criteria in this section. When you click the search icon, depending up on the search criteria, this filters and displays the relevant search combination parameters under the list of Counterbalancing Strategies.

| **Search** | |
|---|---|
| **Field\Icon** | **Description** |
| Search | This icon allows you to search the counterbalancing strategy on the basis of the search criteria specified. Search criteria include a combination of Name, Run Name, Execution Date or Legal Entity. The counterbalancing strategies displayed in the Counterbalancing Strategy summary table are filtered based on the search criteria specified on clicking of this icon. |
| Reset | This icon allows you to reset the search section to its default state that is, without any selections. Resetting the |

| **Search** | |
|---|---|
| **Field\Icon** | **Description** |
| | search section displays all the existing counterbalancing strategies in the Counterbalancing Strategies Summary table. |
| Counterbalancing Strategy Name | This section allows you to search the pre-defined Counterbalancing Strategy on the basis of the Counterbalancing Strategy name. Specify the Counterbalancing Strategy Name to search for the pre-defined Counterbalancing Strategy. |
| Run | This section allows you to search the pre-defined Counterbalancing Strategy on the basis of the Run Name. Specify the Run Name here to search for the pre defined Counterbalancing Strategy. |
| Run Execution Date | This section allows you to search the pre-defined Counterbalancing Strategy on the basis of Execution Date. Specify the Execution Date here to search for the pre-defined Counterbalancing Strategy. |
| Legal Entity | This section allows you to search the pre-defined Counterbalancing Strategy on the basis of Legal Entity. Specify the Legal entity to search for the pre-defined Counterbalancing Strategy. |

**Table 66 Counterbalancing Strategy – Search**

| **List of Runs** | | |
|---|---|---|
| **Icon Name** | **Icon** | **Description** |
| Add |  | This icon allows you to define a new Counterbalancing Strategy. |
| View |  | This icon allows you to view the selected Counterbalancing Strategy. |
| Edit |  | This icon allows you to edit the selected Counterbalancing Strategy. |
| Delete |  | This icon allows you to delete the selected Counterbalancing Strategy. |

**Table 67 Counterbalancing Strategy Summary**

## 8.4 Defining Counterbalancing Strategies

The process of defining Counterbalancing Strategies remains unchanged from LRM version 2.0.

After executing Contractual, BAU and Stress Runs, Counterbalancing Strategies are applied to the liquidity gaps which are identified after execution of the Run.

The step-by-step procedure to apply Counterbalancing Strategies on identified liquidity gaps is as follows:

1. Click + in the counterbalancing strategy summary window. The **Counterbalancing Strategy Definition** window appears to define the counterbalancing strategy.

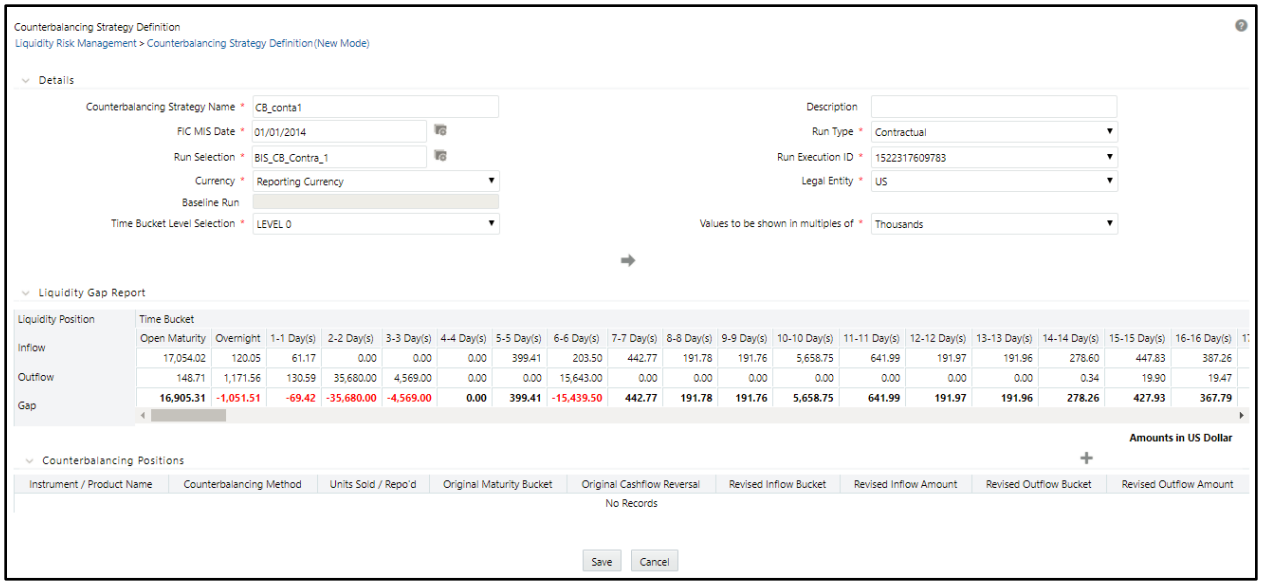



**Figure 52 Counterbalancing Strategy Definition**

2. Enter the name of the counterbalancing strategy in the field **Counterbalancing Strategy Name**.
3. Enter the **Description** of the Counterbalancing Strategy.
4. Click to select the **As of Date** field.

   **Note**: Depending on the As of Date selected, the other fields are filtered and then values are displayed.
5. Select the type of Run (Contractual or Business-As-Usual) under field **Run Type**.
6. Click to select the Run Name in the **Run Selection** field.
7. Select the **Run Execution ID** from the dropdown.
8. Select the **Currency** for which the Counterbalancing Strategy is to be executed.
9. Select the **Legal Entity** for which the Counterbalancing Strategy is to be executed.

10. Select the level at which the **Time Buckets** are to be displayed.
11. Select the **Values to be shown in multiples of** Thousands, Million or Billion, shown in the preceding figure:
12. Click → to display the **Liquidity Gap Report**, shown in the following figure. In case there are any negative gaps, they are highlighted in red.


**Figure 53 Liquidity Gap Report**

13. Click ➕ button in the **Counterbalancing Positions** section to add the counterbalancing strategies. The **Add Counterbalancing Position** window appears.

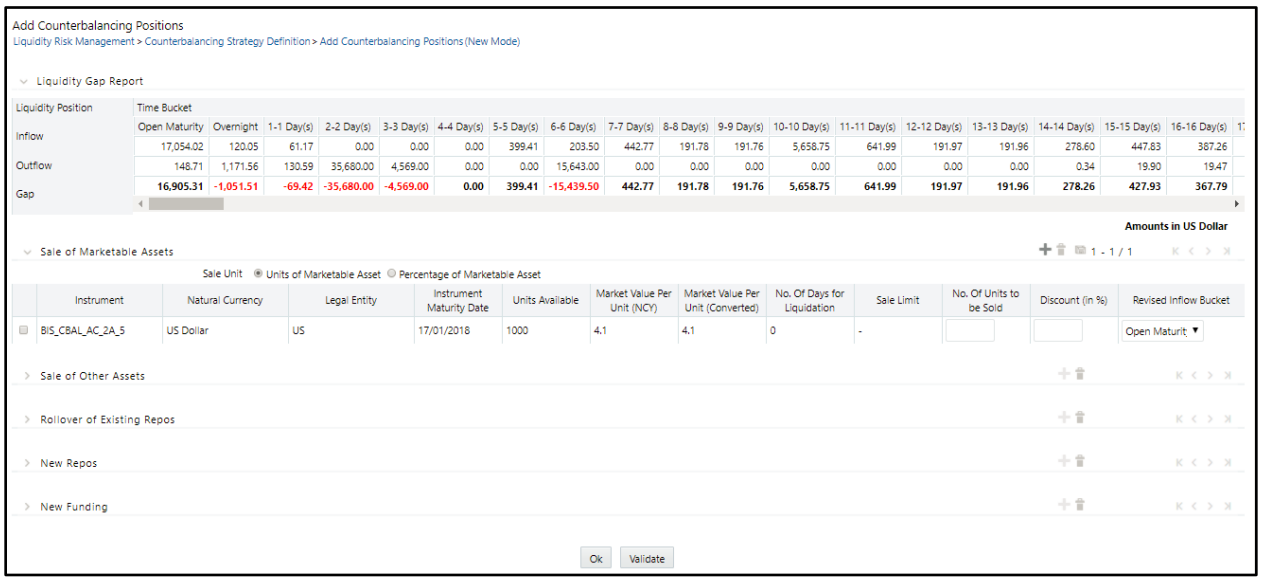



**Figure 54 Add Counterbalancing Positions**

In the **Add Counterbalancing Position** window, perform the following steps:

a. In this window you can define five different types of counterbalancing strategies. Refer section Adding Counterbalancing Positions.

b. Each counterbalancing strategy has its own edit option (➕) which will allow you to select the instrument from the **Instrument Selection** browser window and subsequently apply the counterbalancing strategy to the identified Liquidity Gap. A detailed explanation in relation to the inputs required for each counterbalancing strategy is provided in the section Counterbalancing Positions.

c. If an additional instrument is to be added then click ➕ button and repeat the above stated procedure.

**Note**:

- The errors below may appear while defining Counterbalancing Strategies
- The Counterbalancing strategy name already exists. Please specify a different name: This error appears if you enter the name of the counterbalancing strategy which is already defined then system.
- The upper bound of the Inflow Bucket cannot be less than MIS Date + No. of Days for Liquidation: This error appears when the time bucket selected is less than execution date.
- Units to be sold cannot be greater than the Units Available: This error message appears if the given units to be sold are more than the units available for the selected instrument.
- Discount % needs to be between 0 and 100%: This error message appears if the values provided in the discount field is not between Zero and Hundred.
- Revised Maturity Bucket should fall within the range of the number of days to maturity of the underlying instrument: If the revised maturity date bucket entered is greater than the maturity date of the underlying, this error pop up message would appear.

d. After adding counterbalancing positions, click **OK** or,

e. Click **Validate** to validate the entries updated by you.

The **Validate Counterbalancing Positions** window appears which indicates the positions which have breached limits specified as well as exceed available units.

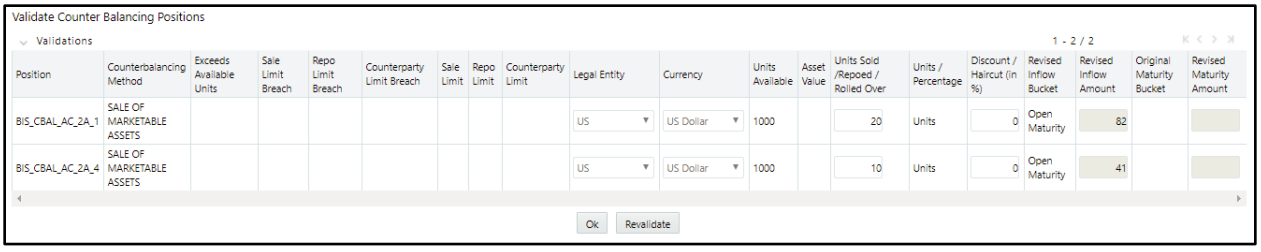



**Figure 55 Validate Counterbalancing Positions**

f. The Validations section displays the following:

- **Positions**: The selected positions in which breach occurs is displayed.
- **Counterbalancing Method**: The counterbalancing method of the position is displayed.
- **Exceeds Available Units** – The positions which exceed available units are marked in red. These are treated as errors and must be changed in order to save the strategy. If any position has this error the strategy cannot be saved.
- **Sale Limit Breach** – The positions which breach sale limit specified are marked in yellow. These are warning messages which are displayed when you continue to save. You are allowed to save the strategy without changing these positions.

- **Repo Limit Breach** – The positions which breach repo limit specified are marked in yellow. These are warning messages which are displayed when you continue to save. You are allowed to save the strategy without changing these positions.
- **Counterparty Limit Breach** – The positions which breach counterparty limit specified are marked in yellow. These are warning messages which are displayed when you continue to save. These are warning messages which are displayed when you continue to save.

g. You are allowed to change the discounts and continue with the definition.

h. To revalidate, click **Revalidate** button. The same window appears with all positions which are rectified and no longer exceed units available or breach limits are marked in green.

i. On the Validate Counterbalancing Positions window, click **OK** to return to the Add Counterbalancing Positions window.

j. On the Add Counterbalancing Positions window, click **OK** to return to the Counterbalancing Strategy Definition.

**Note**:

- The positions are grouped according to the counterbalancing method.
- The Add Counterbalancing Positions window is displayed only when all positions marked in red are rectified.

14. Click **Apply** in the **Counterbalancing Strategy Definition** window to execute the Counterbalancing Strategy and view the updated report with the revised liquidity gaps.

You can now view the time bucket wise gap report and see the impact of each counterbalancing strategy selected in the **Liquidity Gap Report Post Counterbalancing** section. You can save these strategies for future use by clicking the **Save** button.

## 8.4.1 Adding Counterbalancing Positions

This section allows you to add one or multiple counterbalancing positions, which together constitute a counterbalancing strategy. When you click the add + icon, the Counterbalancing Strategy Definition window is displayed where you can specify the counterbalancing positions to be applied.

### 8.4.1.1 Sale of Marketable Assets

To add Sale of Marketable Assets Counterbalancing Strategy, perform the following steps:

a. To select individual marketable instruments that are to be sold, click the add + icon in the Sale of Marketable Assets section. The Instrument Selection browser window is displayed.

b. Select the Instrument to which Sale of Marketable Asset Counterbalancing Strategy is to be applied and click OK.

c. The list of instruments displayed in the Instrument Selection Browser window is taken from the table FSI LRM Instrument table where Marketability Indicator is set to Y.

d. You can alternatively search for the instrument by selecting the various filter options in the Advanced Filter field.

e. The selected information is auto populated from the FSI LRM INSTRUMENT table when you select the instrument in the Instrument Selection Browser window.

f. The following details of each selected instrument are displayed:

- Instrument
- Natural Currency
- Legal Entity
- Instrument Maturity Date
- Units Available
- Market Value Per Unit (NCY)
- Market Value Per Unit (Converted)
- No. of Days for Liquidation
- Sale Limit
- No. of Units / Percentage to be Sold
- Discount (in %)
- Revised Inflow Bucket

g. You must specify the following sale parameters:

- **No. of Units / Percentage to be Sold**: Enter the number of units or percentage of the instrument to be sold based on the Sale Limit parameter selected.
- **Discount (in %)**: Provide information on the discount on the price of the instrument. Discount should be entered in Percentage.
- **Revised Inflow Bucket**: Select the inflow bucket where the stated cash inflow will occur.

For detailed explanation on Sale of Marketable Assets, refer Sale of Marketable Assets.

#### 8.4.1.2 Sale of Other Assets

To add Sale of Other Assets Counterbalancing Strategy, perform the following steps:

a. To select individual assets that are to be sold, click the add + icon in the Sale of Other Assets section. The Non-Marketable Asset Selection browser window is displayed.

b. Select the Non-Marketable Asset to which Sale of Other Assets Counterbalancing Strategy is to be applied and click OK.

c. The information is auto populated from the FSI LRM Instrument table when you select the Asset in the Instrument Selection browser window.

d. The following details of each selected instrument are displayed:

- Asset
- Natural Currency
- Legal Entity
- Asset Value(NCY)
- Asset Value (Converted)
- Number of Days for Liquidation
- Sale Limit
- Value of Assets to be Sold
- Discount (in %)
- Revised Inflow Bucket

e. You must specify the following sale parameters:

- **Value of Assets to be Sold**: Enter the percentage of the instrument to be sold based on the Sale Limit parameter selected.
- **Discount (in %)**: Provide information on discount provided on the price of the instrument. Discount should be entered in percentage.
- **Revised Inflow Bucket**: Select the inflow bucket where above stated cash inflow will occur.

For detailed explanation on Sale of Other Assets, refer Sale of Other Assets.

#### 8.4.1.3 Rollover of Existing Repos

To add Rollover of Existing Repos Counterbalancing Strategy, perform the following steps:

a. To select individual repos, click the add + icon in the Rollover of Existing Repos section. The Repo Selection browser window is displayed.

b. Select the Repo to which Rollover of Existing Repos Counterbalancing Strategy is to be applied and click OK.

c. The list of Repos to be rescheduled, displayed in the Instrument Selection browser window is taken from the FSI LRM Instrument table where encumbrance status is set to 'N' and it's a Repo Transaction.

d. You can alternatively search for the instrument by selecting the various filter options in the Advanced Filter field.

e. The information is auto populated from the Fact Common Account Summary table when you select the Repos in the Instrument Selection Browser window.

f. The following details of each selected instrument are displayed:

- Repo Name
- Natural Currency
- Legal Entity
- Counter Party
- Repo Maturity Date
- Repo Maturity Amount (NCY)
- Repo Maturity Amount (Converted)
- Underlying Instrument
- Instrument Maturity Date
- Units Available
- Market Value Per Unit (NCY)
- Market Value Per Unit (Converted)
- Units to be Rolled Over
- Revised Maturity Bucket
- Haircut (in %)

g. You must specify the following parameters:

- **Units to be Rolled Over**: Provide information on the number of units to be rolled over.
- **Revised Maturity Bucket**: Specify the Revised Time Bucket into which the repo values are to be readjusted. Revised Maturity Bucket should fall within the range of the number of days to maturity of the underlying instrument.
- **Haircut (in %)**: Provide the Haircut in %.

For detailed explanation on Rollover of Existing Repos, refer Rollover of Existing Repos.

#### 8.4.1.4 New Repos

To add New Repos Counterbalancing Strategy, perform the following steps:

a. To select individual new repos, click the add + icon in the New Repos Counterbalancing Strategy section. The New Repos browser window is displayed.

b. Select the instrument to which New Repos Counterbalancing Strategy is to be applied.

c. The list of instruments displayed in the Instrument Selection browser window is taken from the table FSI LRM Instrument table where the underlying is a Repo.

d. You can alternatively search for the instrument by selecting the various filter options in the Advanced Filter field.

e. The information is auto populated from the Fact Common Account Summary table when you select the Instrument to be purchased.

f. The following details of each selected instrument are displayed:

- Instrument
- Natural Currency
- Legal Entity
- Availability Start Date
- Availability End Date
- Units Available
- Market Value per Unit(NCY)
- Market Value per Unit (Converted)
- Repo Limit
- Counter Party
- Revised Maturity Amount
- No. and Units to be Repo'd
- Haircut (in %)
- Revised Inflow Bucket
- Revised Maturity Bucket

g. You must specify the following parameters:

- **No. and Units to be Repo'd**: Enter the number of units to be repo'd.
- **Haircut (in %)**: Provide the Haircut in %.
- **Revised Inflow Bucket**: Enter the Revised Inflow Bucket, that is, in which bucket you are going to purchase the Instrument.
- **Revised Maturity Bucket**: Enter the Revised Maturity Bucket

For detailed explanation on New Repos, refer New Repos

#### 8.4.1.5 New Funding

To add New Funding Counterbalancing Strategy, perform the following steps:

a. To select new funding, click the add + icon in the New Funding Counterbalancing Strategy section. The Product browser window is displayed.

b. Select the Product to which the New Funding Counterbalancing Strategy is to be applied.

c. The list of products to be purchased displayed in the Instrument Selection Browser window is taken from the DIM GL Account table, where GL items with GL Type as Liability is considered.

d. You can alternatively search for the instrument by selecting the various filter options in the Advanced Filter field.

e. Select the product, borrowing date (inflow date), borrowed amount, maturity date and amount.

f. Select a funding product and provide the following parameters:

- **Legal Entity**: Enter the legal entity which is raising the new funding in context of the counterbalancing position.
- **Line of Business**: Enter the line of business of the legal entity which is raising the new funding.
- **Natural Currency**: Enter the natural currency of the new deposit or borrowing account.
- **Counterparty**: Enter the counterparty who is deemed to have provided the new funding.
- **Inflow Bucket**: Enter the transaction start bucket that is, the bucket in which the inflows from the new deposit or borrowing is recorded.
- **Inflow Amount**: Enter the cash received from the new funding.
- **Maturity Bucket**: Enter the maturity bucket of the transaction that is, the bucket in which cash outflows are recorded.
- **Maturity Amount**: Enter the outflow amount at the maturity of the new funding.

For detailed explanation on New Funding, refer New Funding.

# 9 Viewing LRM objects in Metadata Browser

The Liquidity Risk Management under Oracle Financial Services Analytical Applications has the Metadata Browser (MDB). The MDB window displays RRF Runs in application view and LRM objects in object view.

To view LRM applications and objects in MDB, perform the following steps:

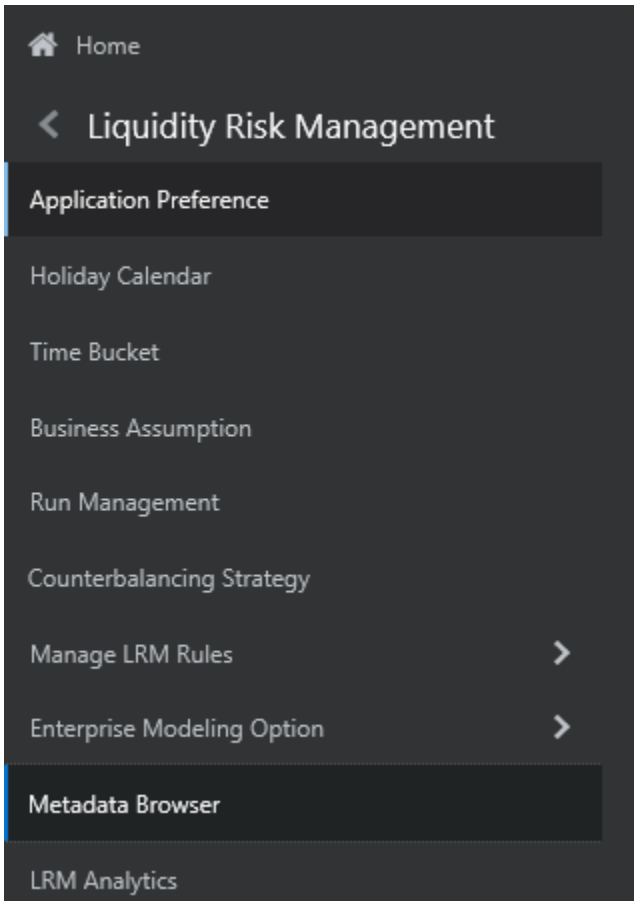
1. Execute the following batches in any date:

   For LRM Objects: ##INFODOM_MDB

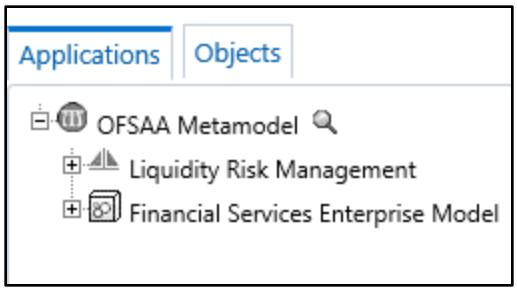
   For LRM Application View: ##INFODOM_MDB_OBJECT_APPLN_MAP

   **Note**: The second batch must be executed after successful completion of the first batch.

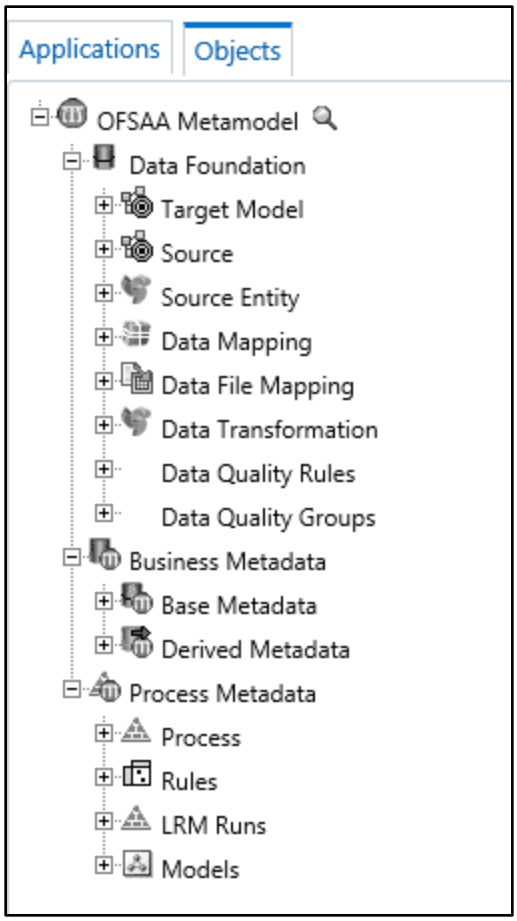
2. After successful execution of the batch, in Oracle Financial Services Analytical Applications Infrastructure window choose, Liquidity Risk Management > Metadata Browser on the Left-Hand Side (LHS) menu.




3. Click the Application tab under Metadata Browser window to view the LRM applications.




4. Click the Object tab under Metadata Browser window to view LRM objects:




- Under Process Metadata > Rules > Business Assumptions, all the business assumptions defined under LRM Business Assumptions window are displayed.
- Under Process Metadata > Rules > Holiday Calendar, all the holiday calendars defined under LRM Holiday Calendar window are displayed.
- Under Process Metadata > Rules > Time Buckets, all the time buckets defined under LRM Time Bucket window are displayed.
- Under Process Metadata > LRM Runs, all the available Runs which are created using LRM Run Management window are displayed.

# 10 Cash Flows

## 10.1 Overview of Cash Flows

Every Product is identified based on its Balance Sheet Category as one of the following:

- Asset
- Liability
- Off Balance Sheet

Cash flows are of two types:

- Account Cash Flow
- Mitigant Cash Flow or Collateral Cash Flow

### 10.1.1 Account Cash Flow

Account cash flows consist of inflows and outflows that occur from a particular account on a periodic basis under contractual terms. The account can be either an asset or a liability. For example, a bank could disburse a bullet loan where interest payments occur periodically, on say a quarterly basis, while the principal is repaid as a single bullet payment at the maturity of the loan. Also, a bank could disburse a loan on EMI basis where both principal and interest is repaid in equal monthly installments across the life of the loan.

### 10.1.2 Mitigant Cash Flow or Collateral Cash Flow

Mitigant or collateral cash flows are cash flows received from the underlying collateral given to the bank by its counterparty, provided, the ownership of the underlying collateral has been transferred to the bank. For example, if a bank has received bonds as collateral against a 5-year loan that it has disbursed, and if the ownership of the collateral is transferred to the bank, then the bank has the right to receive the periodic coupon payments on the underlying bonds till the maturity of the loan. If the ownership of the underlying collateral is not transferred to the bank, then the periodic coupon payments are not payable to the Bank, but will remain with the owner of the collateral.

Similarly, in case of collateral posted by a bank to its counterparty, if the ownership of such an asset is transferred then the cash flows occurring on the collateral will not be considered by the bank during the encumbrance period of the collateral. If the ownership of the collateral is not transferred, then all cash flows from the underlying asset are considered by the bank for its computations.

### 10.1.3 Inflows and Outflows

Contractual cash flows could either be inflows or outflows. Inflows and outflows can occur for both assets and liabilities. For instance, a forward-starting liability transaction can have one or multiple

inflows signifying the start of the transaction and one or multiple outflows including principal and interest payment signifying repayment of the liability.

The above inflows and outflows are categorized based on the Cash Flow Type in the Account Cash Flows Staging table. An inflow is identified by the Cash Flow Type is 'I'. If however, the Cash Flow Type is 'O', then it is classified as an Outflow.

### 10.1.4 Principal and Interest Cash Flows

Further these inflows and outflows are categorized as either Principal or Interest cash flows based on the Financial Element Code in the Account Cash Flows Staging table. If the Financial Element Code is 'I', then it is identified as an Interest Cash Flow. However, the Financial Element Code is 'P', then it is classified as a Principal Cash Flow.

#### 10.1.4.1 Approximation of Interest Cash Flows

OFS LRM takes both principal and interest cashflows into consideration based on user selection. Calculation of the impact of each business assumption on interest cash flows is supported in two ways:

- Business assumption values are applied to both principal and interest cash flows
- Assumption values are applied to principal cash flows only and interest is approximated

If you select the Include Interest Cash flow parameter in the Run Definition window as Yes, both principal and interest cash flows are taken considered for calculations. If you select the Approximate Interest parameter as Yes, then the business assumption is applied only to the principal cash flows and the interest cash flows are approximated based on changes to the principal. If you select Include Interest Cash flow parameter is selected as Yes and Approximate Interest parameter is selected as No, the business assumption values are applied to both principal and interest cash flows. However, this application depends on the manner in which the business assumption is defined as follows:

i. If you have selected Cash Flow Type as a dimension in the business assumption and the dimension member as Principal, then assumption is applied only to the principal cash flows.

ii. If you have selected Cash Flow Type as a dimension in the business assumption and the dimension member as Interest, then assumption impacts only Interest cash flows.

iii. If you have selected Cash Flow Type as a dimension in the business assumption and the dimension member as Principal and Interest, then assumption is applied to both principal and interest cash flows.

iv. If you have not selected Cash Flow Type as a dimension in the business assumption, then assumption is applied to both principal and interest cash flows.

If Include Interest Cash Flow parameter is selected as No, only principal cash flows are considered and interest cash flows are ignored.

The procedure for approximating interest is provided below:

1. Obtain the principal and interest cash flows under contractual terms.
2. Bucket the contractual cash flows based on the user specified time buckets while distinguishing between interest and principal cash flows in each time bucket.
3. Calculate the outstanding balance in each bucket under contractual terms. The outstanding balance in the first time bucket will be the EOP balance. The formula for calculating the outstanding balance for each subsequent bucket is as follows:

$$O/S\ Balance_{Bucket\ n,Contractual} = O/S\ Balance_{Bucket\ n-1,Contractual} - Principal\ CF_{Bucket\ n-1,Contractual}$$

Where,

O/S Balance : Outstanding Balance

CF : Cash Flows

4. Apply the business assumption to estimate principal cash flows. In case of balance based assumptions, this applies to the EOP balance. In case of cash flow based assumptions, this applies to the principal cash flows in a given bucket.
5. Calculate the outstanding balance in each bucket under business-as-usual or stress terms. The outstanding balance in the first time bucket will be the EOP balance. The formula for calculating the outstanding balance for each subsequent bucket is as follows:

$$O/S\ Balance_{Bucket\ n,\ Assumption} = O/S\ Balance_{Bucket\ n-1,\ Assumption} - Revised\ Principal\ CF_{Bucket\ n-1,\ Assumption}$$

6. Calculate the impact on interest cash flows in each bucket under business-as-usual or stress terms as per the following formulas:

$$Interest\ CF_{Bucket\ n,Assumption} = \left(\frac{O/S\ Balance_{Bucket\ n,Assumption} \times Interest\ CF_{Bucket\ n,Contractual}}{O/S\ Balance_{Bucket\ n,Contractual}}\right)$$

$$Change\ in\ Interest\ CF_{Bucket\ n,Assumption} = Interest\ CF_{Bucket\ n,\ Assumption} - Interest\ CF_{Bucket\ n,\ Contractual}$$

**Illustration 1: Impact on Interest Cash Flows under Run-off Assumption**

| Run-off | From Bucket | To Bucket | Assignment Method | Assumption Unit | Assumption Value | Based On | Product |
|---|---|---|---|---|---|---|---|
| | 1-3 Months | 1-7 Days | Selected | Percentage | 10 | Cash Flow | Loan |

**Table 68 Example giving the UI Specification for Run-off Assumption**

**NOTE:** In the following Illustration both Principal and Interest are downloads.

| Measure | Contractual Cash Flows | | | | |
|---|---|---|---|---|---|
| | **Overnight** | **1-7 Days** | **8-15 Days** | **16-30 Days** | **1-3 Months** |
| Principal | 150 | 250 | 330 | 700 | 610 |
| Outstanding Balance (Refer Point 3) | 2000 | 1850 (2000-150) | 1600 (1850-250) | 1270 (1600-330) | 570 (1270-700) |
| Interest | 20 | 40 | 45 | 80 | 70 |
| **Measure** | **Business Assumption** | | | | |
| | **Overnight** | **1-7 Days** | **8-15 Days** | **16-30 Days** | **1-3 Months** |
| Assumption impacted Principal | Nil | (+) 61 | Nil | Nil | (-)61 (610*10%) |
| Revised Principal CF (post business assumption) | 150 (150 + Nil) | 311 (250 + 61) | 330 (330+Nil) | 700 (700 + Nil) | 549 {610 + (-)61} |
| Outstanding Balance (Refer Point 5) | 2000 | 1850 (2000 – 150) | 1539 (1850 – 311) | 1209 (1539-330) | 509 (1209-700) |
| Interest (Refer Point 6) | 20 | 40 | 43.28 (45/1600*1539) | 76.16 (80/1270*1209) | 62.5 (70/570*509) |

**Table 69 Example showing Impact on Interest Cash Flows under Run-off Assumption**

**Illustration 2: Impact on Interest Cash Flows under Growth Assumption**

| Run-off | From Bucket | To Bucket | Assignment Method | Assumption Unit | Assumption Value | Based On | Product |
|---|---|---|---|---|---|---|---|
| | 1-7 Days | Overnight | - | - | 0 | EOP Balance | Loan |
| | | 16-30 Days | Equal | Percentage | 20 | | |

**Table 70 Example giving the UI Specification for Growth Assumption**

**NOTE:** In the following Illustration both Principal and Interest are downloads.

| Contractual Cash Flows | |
|---|---|
| EOP Balance | 2000 |

**Table 71 Download Data**

| Measure | Contractual Cash Flows | | | | |
|---|---|---|---|---|---|
| | **Overnight** | **1-7 Days** | **8-15 Days** | **16-30 Days** | **1-3 Months** |
| Principal | 150 | 250 | 330 | 700 | 610 |
| Outstanding Balance (Refer Point 3) | 2000 | 1850 (2000-150) | 1600 (1850-250) | 1270 (1600-330) | 570 (1270-700) |
| Interest | 20 | 40 | 45 | 80 | 70 |
| **Measure** | **Business Assumption** | | | | |
| | **Overnight** | **1-7 Days** | **8-15 Days** | **16-30 Days** | **1-3 Months** |
| Assumption impacted Principal | Nil | -400 | 200 | 200 | Nil |
| Revised Principal CF (post business assumption) | 150 (150 + Nil) | -150 {250 + (-) 400} | 530 (330+200) | 900 (700 + 200) | 610 (610 + Nil) |

| | | | | | |
|---|---|---|---|---|---|
| Outstanding Balance | 2000 | 1850 (2000-150) | 2000 {1850- (-150)} | 1470 (2000-530) | 570 (1470-900) |
| Total Interest | 20 | 40 | 56.25 (45/1600*2000) | 92.59 (80/1270*1470) | 70 |
| Change in Interest | Nil | Nil | 11.25 ( 56.25-45) | 12.59 (92.59-80) | Nil |

**Table 72 Example showing Impact on Interest Cash Flows under Growth Assumption**

**Illustration 3: Impact on Interest Cash Flows under Growth Assumption (Cash Flow based)**

| Run-off | From Bucket | To Bucket | Assignment Method | Assumption Unit | Assumption Value | Based On | Product |
|---|---|---|---|---|---|---|---|
| | 1-7 Days | Overnight | - | - | 0 | Cash Flow | Loan |
| | | 16-30 Days | Equal | Percentage | 20 | | |

**Table 73 Example giving the UI Specification for Growth Assumption (Cash Flow Based)**

**NOTE:** In the following Illustration both Principal and Interest are downloads.

| Measure | Contractual Cash Flows | | | | |
|---|---|---|---|---|---|
| | **Overnight** | **1-7 Days** | **8-15 Days** | **16-30 Days** | **1-3 Months** |
| Principal | 150 | 250 | 330 | 700 | 610 |
| Outstanding Balance (Refer Point 3) | 2000 | 1850 (2000-150) | 1600 (1850-250) | 1270 (1600-330) | 570 (1270-700) |
| Interest | 20 | 40 | 45 | 80 | 70 |
| **Measure** | **Business Assumption** | | | | |
| | **Overnight** | **1-7 Days** | **8-15 Days** | **16-30 Days** | **1-3 Months** |
| Assumption impacted Principal | Nil | (-) 50 (250*20%) | 25 | 25 | Nil |
| Revised Principal CF (post business | 150 | 200 | 355 | 725 | 610 |

| Measure | Contractual Cash Flows | | | | |
|---|---|---|---|---|---|
| | **Overnight** | **1-7 Days** | **8-15 Days** | **16-30 Days** | **1-3 Months** |
| assumption) | (150 + Nil) | {250 + (-) 50} | (330+25) | (700 + 25) | (610 + Nil) |
| Outstanding Balance | 2000 | 1850<br>(2000-150) | 1650<br>(1850-200) | 1295<br>(1650-355) | 570<br>(1295-725) |
| Total Interest | 20 | 40 | 46.41<br>(45/1600*1650) | 81.57<br>(80/1270*1295) | 70 |
| Change in Interest | Nil | Nil | 1.41<br>(46.41-45) | 1.57<br>(81.57-80) | Nil |

**Table 74 Example showing Impact on Interest Cash Flows under Growth Assumption (Cash Flow Based)**

The application supports the inclusion or exclusion of interest cash flows based on the Run parameters selected by the user. This is also impacted by the inclusion or exclusion of cash flow type as a dimension in the business assumption. The next section details multiple scenarios with different combination of parameters and their impact on interest cash flows.

**Scenario 1: When Interest cash flows are approximated.**

1. Do not include Cash Flow Type as a dimension in the business assumption (Principal + Interest will be considered).
2. In Run Definition window,

   Select Yes in Include Interest Cash Flow and,

   Select Yes in Approximate Interest.

In the above scenario, only Principal cash flows will be impacted. Interest cash flows will be approximated based on change to principal.

**Scenario 2: When interest cash flows are calculated without approximating interest.**

1. Do not include Cash Flow Type as a dimension in the business assumption (Principal + Interest will be considered).
2. In Run Definition window,

   Select Yes in Include Interest Cash Flow and,

   Select No in Approximate Interest.

In the above scenario, both Principal and Interest cash flows will be impacted.

**Scenario 3: When interest cash flows are not considered for computation**.

1. Do not include Cash Flow Type as a dimension in the business assumption (Principal + Interest will be considered).
2. In Run Definition window, select No in Include Interest Cash Flow.

In the above scenario, no impact on Interest cash flows as they are not considered for computation and reporting.

**Scenario 4: When interest cash flows are approximated**.

1. Include Cash Flow Type as a dimension and select Principal in the business assumption.
2. In Run Definition window,

   Select Yes in Include Interest Cash Flow and,

   Select Yes in Approximate Interest.

In the above scenario, only Principal will be impacted. Interest cash flows will be approximated based on change to principal.

**Scenario 5: When Principal is selected as a dimension**.

1. Include Cash Flow Type as a dimension and select Principal in the business assumption.
2. In Run Definition window,

   Select Yes in Include Interest Cash Flow and,

   Select No in Approximate Interest.

In the above scenario, Principal will be impacted because only Principal is selected as a dimension. There will be no change in the interest cash flow amounts.

## 10.2 Cash Flow Aggregation

The application buckets the cash flows at the granularity of the level 0 buckets specified as part of the selected time bucket. Once bucketed, the account cash flows are aggregated at the granularity of the combination of user-specified and mandatory dimensions selected as part of the Application Preferences window. Refer section Mandatory Dimension Configuration for more information. Cash flows are aggregated as part of the contractual Run, on the basis of the dimensional attributes of each account. Further, business assumptions are applied to the aggregated cash flows and not at the individual cash flow level.

## 10.3 Currency Conversion

Cash flows, account balances and other input data is captured and stored in terms of the natural currency of the account. The application converts cash flows and balances from its natural currency to the local or reporting currency based on the prevailing spot rates or forward rates, as specified by you. Local currency is provided for each legal entity as a download while the reporting currency is selected at the time of Run execution.

The features of currency conversion in the LRM Application are as follows:

- Option to select forward exchange rate or spot rate for currency conversion.
- Forward exchange rate is interpolated to the cash flow date using linear or log linear interpolation method, as specified by you.
- If a direct quote between currencies is not available then an indirect quote is used. For currency pairs that do not have a quotation against each other, either direct or indirect, the cross exchange rate is calculated using the direct quotes available against US Dollar (USD) for each currency, as USD is considered as the base currency in each quote. The base currency can be configured in the **SETUP MASTER** table.

# 11 Liquidity Gaps and Cumulative Gaps

## 11.1 Liquidity Gaps

Liquidity gap is the mismatch in a bank's inflows and outflows from various assets and liabilities, due to the difference in the behavior exhibited by the customers. This gap can be positive or negative, depending on whether the bank has more inflows than outflows and vice versa. Liquidity gap can change over the course of each day based on the deposits and withdrawals made and other behavior of the bank as well as its customers.

Liquidity gap is calculated as follows at each user-specified time bucket:

$$\boldsymbol{Liquidity\ Gap = Cash\ Inflows - Cash\ Outflows}$$

Oracle Financial Services Liquidity Risk Management computes the liquidity gap under contractual terms, business-as-usual conditions and stress scenarios. The liquidity gap status under contractual terms is computed based on the cash flows received from an ALM system. Business-as-usual and stress business assumptions are applied to contractual cash flows to obtain gaps under BAU and stress scenarios. The process of creating a business assumption is detailed in Defining a New Business Assumption section. The process of creating contractual and business-as-usual Runs is detailed in Defining a Contractual Run and Defining a Business-as-Usual Run sections respectively and stress Runs in Defining a Stress Run section.

## 11.2 Cumulative Gaps

Cumulative Gap is the net gap from today up to a given time horizon or time bucket in future. It is calculated as the sum of liquidity gaps from the first time bucket up to each future time bucket. Cumulative gap can be positive or negative, depending on whether cumulative inflows are greater than the cumulative outflows and vice versa.

Cumulative gap is computed as follows:

$$\boldsymbol{Cumulative\ Gap_T = \sum_{T=1}^{n} Liquidity\ Gap_T}$$

Where,

T : Each time bucket

N : Total number of time buckets

Cumulative gap is computed under contractual terms, business-as-usual conditions and stress scenarios.

In the below example, Numerical Example **(in $)**.

| Time Bucket | 1-14 Days | 15-28 Days | 29 Days – 3 Months | 3-6 Months |
|---|---|---|---|---|
| Inflows | 500 | 300 | 1000 | 2000 |
| Outflows | 200 | 500 | 1250 | 1500 |
| Liquidity Gap | 300<br>[=500-200] | -200<br>[=300-500] | -250<br>[=1000-1250] | 500<br>[=2000-1500] |
| Cumulative Gap | 300 | 100<br>[=300+(-200)] | -150<br>[=100+(-250)] | 350<br>[=-150+500] |

In the preceding example, the cumulative gap at the end of 6 months works out to $350 whereas the liquidity gap in the 3-6 months' time bucket is $ 500.

**NOTE:** This calculation occurs at the reporting layer.

# 12 Regulatory Calculations

The Regulatory Calculations are available for the following jurisdictions:

- **Bank for International Settlements (BIS)**:
  BIS includes Calculation of LCR, Foreign Currency LCR, Funding Concentrations, NSFR and pre-configured regulatory scenario for LCR and NSFR.
- **US Federal Reserve**:
  US Federal Reserve includes Calculation of LCR, Modified LCR, FR2052A (5G) Template, Regulation YY LCR and pre-configured LCR scenario.
- **Reserve Bank of India (RBI)**:
  RBI includes Calculation of LCR and pre-configured LCR scenario.
- **European Banking Authority (EBA)**:
  EBA includes Calculation of LCR as per CRR and Delegated Act, NSFR calculation and pre-configured LCR scenario.

For detailed explanation of the above Regulatory Calculations refer *OFS Liquidity Risk Management Release - Regulatory Calculations V8.0.6.0.0 User Guide* on OHC Documentation Library.

# 13 Forward Date Liquidity Risk Calculation

Forward date liquidity risk management refers to assessing and viewing the liquidity position of a bank as of one or multiple forward dates under normal and stress conditions. To ensure that liquidity ratios and liquidity gaps remain stable over time and within the boundaries of internal limits, regulatory requirements and market expectations, the bank management forecasts the liquidity metrics for future dates.

In release 8.0.2, Oracle Financial Services Liquidity Risk Management supports the calculation of liquidity risk metrics for forward dates It helps financial institutions to perform the following for one or multiple user-specified forward dates:

i. Forecast balance sheet position

   The application has the ability to forecast the position balances for any future date based on several techniques. Some of the balance forecasting techniques are constant balance, contractual run-off, equally changing balance and so on.

ii. Balance sheet adjustments

   The application provides the ability to adjust the forecasted balance sheet to ensure that the sum total of liabilities and equity is equal to the total assets.

iii. Forecast cash flows based on forward balances

   The application has the ability to forecast the cash flow amounts for any future date based on several techniques. Some of the cash flow forecasting techniques supported by the application are contractual profile, current profile, and default profile and so on.

iv. Use several combinations of balance and cash flow forecasting techniques

   The application provides the ability to use several distinct combinations of techniques for balance and cash flow forecasting. For example, Constant Balance forecasting technique for balance forecasting may be used with either Contractual Profile or Current profile techniques for cash flow forecasting.

v. Use any techniques for a combination of Product, Legal Entity and Currency:

   The application provides the ability to select or assign any distinct combination of balance and cash flow forecasting techniques for each combination of Product, Legal Entity and Currency.

vi. Compute components of LCR for future dates

   The application has the ability to compute LCR and it’s components such as HQLA, NCOF and so on for any future date based on the forward balances and cash flow amounts generated based multiple techniques. Currently, forward date LCR is computed only as per US Federal Reserve Liquidity Coverage Ratio guidelines i.e. when the Run Purpose is selected as U.S Fed Liquidity Ratio Calculation.

vii. Compare liquidity risk metrics between as of date and future dates

The application provides the ability to analyze and compare the liquidity metrics including forward balances, LCR etc. between the as of date i.e. the current date and any future date for which the forward date liquidity risk calculations have been executed.

viii. Compare liquidity risk metrics across future dates:

The application provides the ability to analyze and compare the liquidity metrics including forward balances, LCR etc. between 2 future dates for which the forward date liquidity risk calculations have been executed or across future dates. Users can view the interim calculations as well as variances between the risk metrics across 2 dates.

## 13.1 Overview of Forward Date Liquidity Risk Calculation

Oracle Financial Services Liquidity Risk Management comprehensively addresses an organization's forward liquidity risk calculation requirements, through a flexible user interface, robust calculations, and advanced reporting. It supports pre-configured calculations, scenarios, and reporting dashboards.

The application supports the following functionality related to forward liquidity risk calculation:

- Granularity of forward records
- Computation of forward dates
- Computation of forward time buckets
- Computation of forward balances
- Adjustment of forward balance sheets
- Allocation techniques on the forward balances
- Calculation of forward cash flows
- Calculation of forward liquidity coverage ratio

### 13.1.1 Granularity of Forward Records

The spot balances and cash flows are available at the account level granularity. However, the application computes forward date liquidity metrics at an aggregate level and captures the inputs required for forward calculations at a higher level of granularity. The granularity of forward balance and cash flow calculations, i.e. the download dimensions, supported by the application for all assets and liabilities other than derivatives is as follows:

a. Product

b. Currency

c. Legal Entity

d. Controlled by Treasury Flag

e. Transferability Restriction

The download dimensions supported by the application for derivatives are as follows:

a. Legal Entity

b. Currency

c. Payment Netting Flag

The forward balances and cash flows computed at a higher granularity are then allocated back to the granularity of spot calculations in order to ensure consistency between the spot and forward date calculations.

### 13.1.2 Computation of Forward Dates

The application allows users to define forward dates in 2 ways: specification of fixed intervals and calendar selection of forward dates. If the forward dates have fixed intervals between them users can provide the fixed interval forward date parameters and the application will compute the actual forward dates. The process of specifying fixed interval forward date parameters is provided in section Run Management.

The application computes the forward dates based on the fixed interval parameters specified as part of the Run Management window as follows:

1. The first forward date is calculated as follows:

$$\boldsymbol{First\ Forward\ Date = As\ of\ Date + First\ Forward\ Date\ Interval}$$

Where,

As of Date : FIC MIS Date

First Forward Date Interval : Interval between the as of date and the first forward date specified by the user

2. The subsequent forward dates are calculated as follows:

$$\boldsymbol{Forward\ Date_{F+x} = Forward\ Date_{(F+x)-x} + Forward\ Date\ Frequency}$$

Where,

F + x : Each forward date subsequent to the first forward date

(F + x) – x : Previous forward date

x : Interval between each forward date that is,. forward date frequency

This calculation is performed till the application achieves the number of forward dates specified by you this include the first forward date that is, (Number of Forward Dates – 1) times.

The forward date calculation process is illustrated below:

Example 1:

| | |
|---|---|
| **As of Date** | January 30, 2015 |
| **First Forward Date Interval (in days)** | 1 |
| **Forward Date Frequency** | 1 month |
| **No. of Forward Calculations** | 3 |
| **First Forward Date** | January 30, 2015 +1 day = January 31, 2015 |
| | As of Date + First Forward Date Interval |
| **Second Forward Date** | January 31, 2015 + 1 month = February 28, 2015 |
| | First Forward Date + Forward Date Frequency |
| **Third Forward Date** | February 28, 2015 + 1 month = March 31, 2015 |
| | Second Forward Date + Forward Date Frequency |

Example 2:

| | |
|---|---|
| **As of Date** | January 29, 2015 |
| **First Forward Date Interval (in days)** | 1 |
| **Forward Date Frequency** | 1 week |
| **No. of Forward Calculations** | 3 |
| **First Forward Date** | January 29, 2015 +1 day = January 30, 2015 |
| | As of Date + First Forward Date Interval |
| **Second Forward Date** | January 30, 2015 + 1 week = February 6, 2015 |
| | First Forward Date + Forward Date Frequency |
| **Third Forward Date** | February 6, 2015 + 1 week = February 13, 2015 |
| | Second Forward Date + Forward Date Frequency |

### 13.1.3 Computation of Forward Time Buckets

Once the forward dates are identified for a given Run, the time buckets are computed for each of those forward dates based on the user specified time bucket definition. Time buckets are defined in terms of days and are independent of dates. In case of forward date calculations, the application computes the forward starting time buckets for each future date for which forward liquidity calculations are to be carried out. The time bucket start and end dates are calculated for each forward starting time bucket for each forward date and the forward cash flows are bucketed appropriately taking into account the business day convention.

The process of calculating time bucket start and end dates for current date and each forward date is illustrated below:

| **Time Bucket Definition** | | **Current Date** | | **Forward Dates** | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **30-Jan-15** | | **31-Jan-15** | | **28-Feb-15** | | **31-Mar-15** | |
| **Time Buckets** | **Frequency (in Days)** | **Time Bucket Start Date** | **Time Bucket End Date** | **Time Bucket Start Date** | **Time Bucket End Date** | **Time Bucket Start Date** | **Time Bucket End Date** | **Time Bucket Start Date** | **Time Bucket End Date** |
| Open Maturity | | | | | | | | | |
| Overnight | | | | | | | | | |
| 1-1 Day | 1 | 31-Jan-15 | 31-Jan-15 | 1-Feb-15 | 1-Feb-15 | 1-Mar-15 | 1-Mar-15 | 1-Apr-15 | 1-Apr-15 |
| 2-2 Day | 1 | 1-Feb-15 | 1-Feb-15 | 2-Feb-15 | 2-Feb-15 | 2-Mar-15 | 2-Mar-15 | 2-Apr-15 | 2-Apr-15 |
| 3-3 Day | 1 | 2-Feb-15 | 2-Feb-15 | 3-Feb-15 | 3-Feb-15 | 3-Mar-15 | 3-Mar-15 | 3-Apr-15 | 3-Apr-15 |
| 4-4 Day | 1 | 3-Feb-15 | 3-Feb-15 | 4-Feb-15 | 4-Feb-15 | 4-Mar-15 | 4-Mar-15 | 4-Apr-15 | 4-Apr-15 |

| Time Bucket Definition | | Current Date | | Forward Dates | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 30-Jan-15 | | 31-Jan-15 | | 28-Feb-15 | | 31-Mar-15 | |
| Time Buckets | Frequency (in Days) | Time Bucket Start Date | Time Bucket End Date | Time Bucket Start Date | Time Bucket End Date | Time Bucket Start Date | Time Bucket End Date | Time Bucket Start Date | Time Bucket End Date |
| 5-5 Day | 1 | 4-Feb-15 | 4-Feb-15 | 5-Feb-15 | 5-Feb-15 | 5-Mar-15 | 5-Mar-15 | 5-Apr-15 | 5-Apr-15 |
| 6-6- Day | 1 | 5-Feb-15 | 5-Feb-15 | 6-Feb-15 | 6-Feb-15 | 6-Mar-15 | 6-Mar-15 | 6-Apr-15 | 6-Apr-15 |
| 7-7 Day | 1 | 6-Feb-15 | 6-Feb-15 | 7-Feb-15 | 7-Feb-15 | 7-Mar-15 | 7-Mar-15 | 7-Apr-15 | 7-Apr-15 |
| 8-8 Day | 1 | 7-Feb-15 | 7-Feb-15 | 8-Feb-15 | 8-Feb-15 | 8-Mar-15 | 8-Mar-15 | 8-Apr-15 | 8-Apr-15 |
| 9-9 Day | 1 | 8-Feb-15 | 8-Feb-15 | 9-Feb-15 | 9-Feb-15 | 9-Mar-15 | 9-Mar-15 | 9-Apr-15 | 9-Apr-15 |
| 10-10 Day | 1 | 9-Feb-15 | 9-Feb-15 | 10-Feb-15 | 10-Feb-15 | 10-Mar-15 | 10-Mar-15 | 10-Apr-15 | 10-Apr-15 |
| Unspecified | | | | | | | | | |

### 13.1.4 Computation of Forward Balances

The application provides the ability to compute the forward balance of assets and liabilities for multiple future dates as part of its forward liquidity calculation capability. It supports multiple methodologies for computing these forward balances which include:

- Contractual Run Off
- Equally Changing Balance
- Balance Download
- Balance Change Download
- Constant Balance
- Cash Flow Download Method

The application allows users to map the forward balance calculation methods to the desired dimensional combinations such as product-currency or simply a single dimension such as product through a rule defined as part of the Rule Run Framework. This mapping is to be done for all assets and liabilities, other than derivatives, based on a combination of the download dimensions supported for them for forward calculation. The list of download dimensions supported for forward calculations is detailed as part of section Granularity of Forward Records above.

The application supports a pre-configured rule for mapping the forward balance calculation methods named “LRM - Balance Method Reclassification - Forecast”. This has default values mapped for assets and liabilities. These default mappings can be changed by the users and the rule can be re-saved to reflect these changes. Alternatively, users can create their own mapping rules in the Rules Framework to address regulatory and risk management needs. However, only one mapping rule is allowed to be selected in the Run Management window for a given forward liquidity Run, based on which all further calculations are done as part of that forward Run.

The forward balance calculation methods supported by the application are explained in detail below:

1. **Contractual Run Off**:

   The steps involved in calculating balances at a forward date under contractual terms when the method is selected as “contractual run off” are as follows:

   a. The un-bucketed contractual cash flows based on the current date are obtained as a download. The current date is equal to the As of Date selected during Run Execution.

   b. The current balance of each account as of the “As of Date” is received. This is the starting balance for forward date calculations.

   c. The application calculates the forward balance as of the first forward date as follows:

$$Balance_F = Max\left\{EOP\ Minimum\ Threshold, \left(Balance_C - \sum_{C+1}^{F} Contractual\ Cash\ Flows\right)\right\}$$

Where,

F : First forward date

C : Current date i.e. As of Date selected in the Run Management window

EOP Minimum Threshold : Floor for the account balance i.e. the minimum balance to be maintained at all times

d. The application calculates the forward balance for each subsequent forward date as follows:

$$Balance_{F+x} = Max\left\{EOP\ Minimum\ Threshold, \left(Balance_C - \sum_{C+1}^{(F+x)} Contractual\ Cash\ Flows\right)\right\}$$

Where,

F + x : Each subsequent forward date

x : Interval between each forward date

**Note**:

1. If a EOP minimum threshold is specified, the contractual cash flows are run-off only till the minimum threshold is reached. Any contractual cash flows which results in the forward balance dropping below the minimum threshold will not be run-off. Once the minimum threshold is reached, it is maintained as constant balance for all subsequent forward dates for that Run and dimensional combination.

   For instance the forward balance as of 31st December is 5200, minimum threshold is 5000 and contractual cash outflow between 31st December and the next forward date which is 31st January is 500. In this case, the balance as of 31st January is 5000 i.e. (minimum of 5000, 5200-500).

2. If no minimum threshold is specified, then the application runs off the contractual cash flows till balance equals zero.

The contractual run-off method is illustrated below. The inputs required for this method are provided below considering the spot date as 03/01/2015. All values are in terms of US Dollars.

| Product | Spot Balance | EOP Minimum Threshold |
|---|---|---|
| Loan 1 | 1,000 | |
| Loan 2 | 2,000 | |
| XYZ ( TD) | 1,000 | |
| ABC ( Retail Lending ) | 2,000 | |
| Loan 3 | 5,000 | |
| Advances | 10,000 | |
| Demand Deposit | 3,000 | |
| Loan 4 | 20,000 | 2,000 |
| Loan 5 | 20,000 | 10,000 |
| Loan 6 | 20,000 | 40,000 |

The contractual cash flow position as of the spot date for each product is as follows:

| Product | Cash Flow Date | Cash Flow Type | Outflow Amount | Inflow Amount |
|---|---|---|---|---|
| Loan 1 | 2-Mar-15 | Outflow | 1,000 | |
| Loan 2 | 2-Mar-15 | Outflow | 500 | |
| Loan 2 | 15-Mar-15 | Outflow | 400 | |
| Loan 2 | 1-Apr-15 | Outflow | 200 | |
| Loan 2 | 16-Apr-15 | Outflow | 600 | |
| Loan 2 | 1-May-15 | Outflow | 300 | |
| XYZ ( TD) | 31-Mar-15 | Outflow | 1,000 | |
| ABC ( Retail Lending ) | 3-Apr-15 | Inflow | | 500 |

| Product | Cash Flow Date | Cash Flow Type | Outflow Amount | Inflow Amount |
|---|---|---|---|---|
| ABC ( Retail Lending ) | 10-Apr-15 | Inflow | | 800 |
| ABC ( Retail Lending ) | 25-Apr-15 | Inflow | | 700 |
| Loan 3 | 1-Jan-18 | Inflow | | 5,000 |
| Demand Deposit | 2-Mar-15 | Outflow | 3,000 | |
| Advances | 1-May-15 | Outflow | 1,500 | |
| Advances | 5-May-15 | Outflow | 800 | |
| Advances | 10-Jul-15 | Outflow | 500 | |
| Advances | 11-Aug-15 | Outflow | 200 | |
| Advances | 1-Dec-15 | Outflow | 5,000 | |
| Loan 4 | 4-Apr-15 | Outflow | 5,000 | |
| Loan 4 | 1-Aug-16 | Outflow | 2,000 | |
| Loan 5 | 1-Aug-16 | Outflow | 7,000 | |
| Loan 5 | 1-Sep-16 | Outflow | 7,000 | |
| Loan 6 | 1-Aug-16 | Outflow | 7,000 | |
| Loan 6 | 1-Sep-16 | Outflow | 7,000 | |

The forward balances under different scenarios are explained as follows:

- Scenario I : Entire balance is run off during the forecasting horizon
- Scenario II : No run-off during the forecasting horizon
- Scenario III: Balance is run-off partially during the forecasting horizon
- Scenario IV : Entire balance has run-off prior to the first forward date
- Scenario V: Balance runs-off on the first forward date after the spot date
- Scenario VI: Run-offs are happening on the forward dates
- Scenario VII: Run off is not happening till EOP minimum threshold
- Scenario VIII: Balance runs-off till EOP minimum threshold
- Scenario IX: EOP minimum threshold is more than spot EOP

| Forward Date | Scenario I | Scenario II | Scenario III | Scenario IV | | Scenario V | Scenario VI | Scenario VII | Scenario VIII | Scenario IX |
|---|---|---|---|---|---|---|---|---|---|---|
| | Retail Lending | Loan 3 | Advances | Demand Deposit | XYZ( TD) | Loan 1 | Loan 2 | Loan 4 | Loan 5 | Loan 6 |
| 1-Apr-15 | 2,000 | 5,000 | 10,000 | | | | 900 | 20,000 | 20,000 | 20,000 |
| 1-May-15 | | 5,000 | 8,500 | | | | | 15,000 | 20,000 | 20,000 |
| 1-Jun-15 | | 5,000 | 7,700 | | | | | 15,000 | 20,000 | 20,000 |
| 1-Jul-15 | | 5,000 | 7,700 | | | | | 15,000 | 20,000 | 20,000 |
| 1-Aug-15 | | 5,000 | 7,200 | | | | | 13,000 | 13,000 | 13,000 |
| 1-Sep-15 | | 5,000 | 7,000 | | | | | 13,000 | 10,000 | 6,000 |
| 1-Oct-15 | | 5,000 | 7,000 | | | | | 13,000 | 10,000 | 6,000 |
| 1-Nov-15 | | 5,000 | 7,000 | | | | | 13,000 | 10,000 | 6,000 |
| 1-Dec-15 | | 5,000 | 2,000 | | | | | 13,000 | 10,000 | 6,000 |
| 1-Jan-16 | | 5,000 | 2,000 | | | | | 13,000 | 10,000 | 6,000 |
| 1-Feb-16 | | 5,000 | 2,000 | | | | | 13,000 | 10,000 | 6,000 |
| 1-Mar-16 | | 5,000 | 2,000 | | | | | 13,000 | 10,000 | 6,000 |

2. **Equally Changing Balance**:

   The steps involved in calculating balances at a forward date under contractual terms when the method is selected as “equally changing balance” are as follows**:**

   a. The following parameters are obtained as inputs:

      i. First Forward Date Balance

         This is the forward balance as of the first forward date. If this parameter is not provided, the application considers the spot balance as the first forward balance as well.

      ii. Forecasting Period

         This is the number of calendar days over which the balance is changing equally i.e. either reducing or increasing in an equal manner. This is a mandatory parameter

      iii. Last Forward Balance

         This is the balance as of the last forward date and is an optional parameter. If this value is not provided, the balance is run-off equally to zero.

         **Note**:

         You are required to provide this parameter if an increase in forward balance vis-a-vis the spot balance is to be calculated.

   b. The application calculates the equally changing amount on each day as follows:

      **i.** When holidays are included:

$$\textbf{\textit{Amount per Day}} = \frac{\textbf{\textit{First Forward Date Balance}} - \textbf{\textit{Last Forward Balance}}}{\textbf{\textit{Forecasting Period}}}$$

      ii. When holidays are excluded:

$$\textbf{\textit{Amount per Day}} = \frac{\textbf{\textit{First Forward Date Balance}} - \textbf{\textit{Last Forward Balance}}}{\textbf{\textit{Business Days in Forecasting Period}}}$$

      **Note**:

      The equally changing amount computed here is the forward cash flow as of each calendar or business day depending on whether holidays are included or excluded. In case holidays are excluded for calculating the equally changing amount, the cash flows on such excluded days are 0.

   c. The balance for each dimensional combination on each forward date is calculated as follows:

$$\boldsymbol{Forward\ Balance_{F+x}} = \boldsymbol{Max}\left\{\boldsymbol{EOP\ Minimum\ Threshold}, \left(\boldsymbol{Forward\ Balance_F} - \sum_{\boldsymbol{t=F+1}}^{\boldsymbol{F+x}} \boldsymbol{Amount\ per\ Day_t}\right)\right\}$$

Where,

F : Previous forward balance. The balance as of the first forward date is provided as a download.

x : Interval between each forward date

t : Time period between previous forward date (exclusive) to next forward date (inclusive)

The equally changing balance method is illustrated below. The inputs required for this method are provided below. All values are in terms of US Dollars.

| **Input** | | | | | **Calculation of Amount Per Day** | | | |
|---|---|---|---|---|---|---|---|---|
| Product Name | **First Forward Balance (a)** | **First Forward Date (b)** | **Forecasting Period (in Days) (c)** | **Last Forward Balance (d)** | **Last Forward Date (b + c)** | **Business Days in Forecasting Period (e)** | **Amount Per Calendar Day (f = (a - d) ÷ c)** | **Amount Per Business Day (g = (a - d) ÷ e)** |
| Loan 1 | 5,000 | 1-Apr-15 | 4 | 1,000 | 5-Apr-15 | 3 | 1000 | 1333 |
| Demand Deposit | 3,000 | 1-Apr-15 | 7 | 1,000 | 8-Apr-15 | 6 | 286 | 333 |
| Advances | 10,000 | 1-Apr-15 | 15 | | 16-Apr-15 | 12 | 667 | 833 |
| Loan 2 | 10,000 | 1-Apr-15 | 5 | 15,000 | 6-Apr-15 | 4 | -1000 | -1250 |

The calculation of forward balances is illustrated under the following scenarios:

1. Scenario I: When holidays are Excluded, Forecasting Period < Forecasting Horizon and EOP Balance is Reducing
2. Scenario II: When holidays are Included, Forecasting Period < Forecasting Horizon and EOP Balance is Reducing
3. Scenario III: When holidays are Excluded, Forecasting Period > Forecasting Horizon and EOP Balance is Reducing
4. Scenario IV: When holidays are Excluded, Forecasting Period > Forecasting Horizon and EOP Balance is Increasing

| Forward Date | Holiday | Scenario I | | Scenario II | | Scenario III | Scenario IV |
|---|---|---|---|---|---|---|---|
| | | Loan 1 Balance | Demand Deposit Balance | Loan 1 Balance | Demand Deposit Balance | Advances Balance | Loan 2 Balance |
| 1-Apr-15 | N | 5,000 | 3,000 | 5,000 | 3,000 | 10,000 | 10,000 |
| 2-Apr-15 | N | 3,667 | 2,667 | 4,000 | 2,714 | 9,167 | 11,250 |
| 3-Apr-15 | N | 2,333 | 2,333 | 3,000 | 2,429 | 8,333 | 12,083 |
| 4-Apr-15 | Y | 2,333 | 2,333 | 2,000 | 2,143 | 8,333 | 12,083 |
| 5-Apr-15 | Y | 2,333 | 2,333 | 1,000 | 1,857 | 8,333 | 12,083 |
| 6-Apr-15 | N | 1,000 | 2,000 | 1,000 | 1,571 | 7,500 | 12,917 |
| 7-Apr-15 | N | 1,000 | 1,667 | 1,000 | 1,286 | 6,667 | 13,750 |
| 8-Apr-15 | N | 1,000 | 1,000 | 1,000 | 1,000 | 5,833 | 15,000 |

3. **Balance Download**:

   The steps involved in calculating balances at a forward date under contractual terms when the method is selected as "balance download" are as follows**:**

   a. The forward balances for multiple forward dates are received as a download across dimensional combinations.

   b. The application computes the forward balance for missing forward dates as follows:

      i. If forward balance is not available for each forward date

      The missing forward balance is interpolated using the balances available on the dates immediately prior and immediately following the missing forward date as follows:

$$\mathbf{Y_t = Y_{t-1} + (Y_{t+1} - Y_{t-1}) \times \frac{t - (t-1)}{(t+1) - (t-1)}}$$

Where,

$Y_t$ : Missing forward balance

$Y_{t-1}$ : Known balance on forward date immediately preceding the missing forward date

$Y_{t+1}$ : Balance on forward date immediately succeeding the missing forward date

t : Cumulative time, in days, from first forward date to each subsequent forward date. The cumulative time is based on business days if holidays are to be excluded and based on calendar days if holidays are to be included.

An example of interpolation when frequency of forward dates is a week and holidays are included is as follows:

| **Input** | | **Calculation** | | | |
|---|---|---|---|---|---|
| **Forward Date** | **Forward Balance Download Value** | **Period Start** | **Period End** | **Cumulative Calendar Days** | **Missing Forward Balance** |
| 31-Jan-14 | 742 | 31-Jan-14 | 31-Jan-14 | 1 | |
| 07-Feb-14 | 438 | 01-Feb-14 | 07-Feb-14 | 8 | |

| Input | | Calculation | | | |
|---|---|---|---|---|---|
| **Forward Date** | **Forward Balance Download Value** | **Period Start** | **Period End** | **Cumulative Calendar Days** | **Missing Forward Balance** |
| 14-Feb-14 | | 08-Feb-14 | 14-Feb-14 | 15 | 521 |
| 21-Feb-14 | 604 | 15-Feb-14 | 21-Feb-14 | 22 | |
| 28-Feb-14 | 859 | 22-Feb-14 | 28-Feb-14 | 29 | |
| 07-Mar-14 | 426 | 01-Mar-14 | 07-Mar-14 | 36 | |
| 14-Mar-14 | 268 | 08-Mar-14 | 14-Mar-14 | 43 | |
| 21-Mar-14 | 379 | 15-Mar-14 | 21-Mar-14 | 50 | |
| 28-Mar-14 | | 22-Mar-14 | 28-Mar-14 | 57 | 546 |
| 04-Apr-14 | | 29-Mar-14 | 04-Apr-14 | 64 | 712 |
| 11-Apr-14 | | 05-Apr-14 | 11-Apr-14 | 71 | 879 |
| 18-Apr-14 | 1045 | 12-Apr-14 | 18-Apr-14 | 78 | |

An example of interpolation when frequency of forward dates is a week and holidays are excluded is as follows:

| Input | | Calculation | | | |
|---|---|---|---|---|---|
| **Forward Date** | **Forward Balance Download Value** | **Period Start** | **Period End** | **Cumulative Business Days** | **Missing Forward Balance** |
| 31-Jan-14 | 742 | 31-Jan-14 | 31-Jan-14 | 1 | |
| 07-Feb-14 | 438 | 01-Feb-14 | 07-Feb-14 | 6 | |
| 14-Feb-14 | | 08-Feb-14 | 14-Feb-14 | 11 | 521 |

| Input | | Calculation | | | |
|---|---|---|---|---|---|
| **Forward Date** | **Forward Balance Download Value** | **Period Start** | **Period End** | **Cumulative Business Days** | **Missing Forward Balance** |
| 21-Feb-14 | 604 | 15-Feb-14 | 21-Feb-14 | 16 | |
| 28-Feb-14 | 859 | 22-Feb-14 | 28-Feb-14 | 21 | |
| 07-Mar-14 | 426 | 01-Mar-14 | 07-Mar-14 | 26 | |
| 14-Mar-14 | 268 | 08-Mar-14 | 14-Mar-14 | 30 | |
| 21-Mar-14 | 379 | 15-Mar-14 | 21-Mar-14 | 35 | |
| 28-Mar-14 | | 22-Mar-14 | 28-Mar-14 | 39 | 506 |
| 04-Apr-14 | | 29-Mar-14 | 04-Apr-14 | 44 | 664 |
| 11-Apr-14 | | 05-Apr-14 | 11-Apr-14 | 48 | 791 |
| 18-Apr-14 | 1045 | 12-Apr-14 | 18-Apr-14 | 56 | |

**Note:**

Business days exclude weekends and other holidays.

ii. If a forward balance is not available on the last forward date

The missing forward balance is extrapolated using the forward balances available on the two dates immediately prior to the missing forward date as follows:

$$Y_t = Max\left[EOP\ Minimum\ Threshold, \left\{Y_{t-2} + (Y_{t-1} - Y_{t-2}) \times \frac{t-(t-2)}{(t-1)-(t-2)}\right\}\right]$$

Where,

$Y_t$ : Missing observation i.e. value of the forward balance to be forecasted at time‘t’

$Y_{t-1}$ : Known value of observation at time‘t-1’

$Y_{t-2}$ : Known value of observation at time‘t-2’

t : Cumulative time, in days, from start date of the first observation period to the end of each observation period

An example of extrapolation when frequency of forward dates is a month and holidays are included is as follows:

| **Input** | | **Calculation** | | | |
|---|---|---|---|---|---|
| **Forward Date** | **Forward Balance Download Value** | **Period Start** | **Period End** | **Cumulative Calendar Days** | **Missing Forward Balance** |
| 31-Jan-14 | 742 | 31-Jan-14 | 31-Jan-14 | 1 | |
| 28-Feb-14 | 438 | 01-Feb-14 | 28-Feb-14 | 29 | |
| 31-Mar-14 | 724 | 01-Mar-14 | 31-Mar-14 | 60 | |
| 30-Apr-14 | 603 | 01-Apr-14 | 30-Apr-14 | 90 | |
| 31-May-14 | 859 | 01-May-14 | 31-May-14 | 121 | |
| 30-Jun-14 | 426 | 01-Jun-14 | 30-Jun-14 | 151 | |
| 31-Jul-14 | 268 | 01-Jul-14 | 31-Jul-14 | 182 | |
| 31-Aug-14 | 379 | 01-Aug-14 | 31-Aug-14 | 213 | |
| 30-Sep-14 | | 01-Sep-14 | 30-Sep-14 | 243 | 486 |
| 31-Oct-14 | | 01-Oct-14 | 31-Oct-14 | 274 | 597 |
| 30-Nov-14 | | 01-Nov-14 | 30-Nov-14 | 304 | 705 |
| 31-Dec-14 | | 01-Dec-14 | 31-Dec-14 | 335 | 816 |

An example of extrapolation when frequency of forward dates is a month and holidays are excluded is as follows**:**

| Input | | Calculation | | | |
|---|---|---|---|---|---|
| **Forward Date** | **Forward Balance Download Value** | **Period Start** | **Period End** | **Cumulative Business Days** | **Missing Forward Balance** |
| 31-Jan-14 | 742 | 31-Jan-14 | 31-Jan-14 | 1 | |
| 28-Feb-14 | 438 | 01-Feb-14 | 28-Feb-14 | 21 | |
| 31-Mar-14 | 724 | 01-Mar-14 | 31-Mar-14 | 42 | |
| 30-Apr-14 | 603 | 01-Apr-14 | 30-Apr-14 | 64 | |
| 31-May-14 | 859 | 01-May-14 | 31-May-14 | 86 | |
| 30-Jun-14 | 426 | 01-Jun-14 | 30-Jun-14 | 107 | |
| 31-Jul-14 | 268 | 01-Jul-14 | 31-Jul-14 | 130 | |
| 31-Aug-14 | 379 | 01-Aug-14 | 31-Aug-14 | 151 | |
| 30-Sep-14 | | 01-Sep-14 | 30-Sep-14 | 173 | 495 |
| 31-Oct-14 | | 01-Oct-14 | 31-Oct-14 | 196 | 617 |
| 30-Nov-14 | | 01-Nov-14 | 30-Nov-14 | 216 | 723 |
| 31-Dec-14 | | 01-Dec-14 | 31-Dec-14 | 239 | 844 |

**Note:**

1. If there is only 1 known observation, then the missing observation is estimated as the value of the preceding known observation.
2. If the balance is not provided for the first forward date in the forecasting horizon, the application will not compute the forward balance for such a dimensional combination. First forward balance is mandatory.

3. If the last forward date and corresponding balance provided as a download occurs after the last date in the forecasting horizon, only those balances missing till the end of the forecasting horizon are interpolated.
4. The application supports only the Balance Download Method or Constant Balance Method for computing forward balances for liquidity pool assets i.e. those assets which are controlled by treasury.

4. **Balance Change Download**:

The steps involved in calculating balances at a forward date under contractual terms when the method is selected as "balance change download" are as follows:

a. The balance change for multiple forward dates is received as a download across dimensional combinations. A positive value indicates an increase in balance while a negative value indicates reduction.

b. The spot balances are identified for the same dimensional combination as the balance change download.

c. The application calculates the forward balance as of each day as follows:

$$\boldsymbol{Forward\ Balance_F = Max\left\{EOP\ Minimum\ Threshold, \left(Forward\ Balance_{F-x} + \sum_{t=F-x+1}^{F} Balance\ Change_t\right)\right\}}$$

Where,

F : Each forward date for which balance is calculated

F – x : Previous forward date for which calculations are done

x : Interval between each forward date

t : Time period between previous forward date (exclusive) to next forward date (inclusive)

**Note**:

1. If no balance change is specified for time period between previous forward date to next forward date, then the balance calculated as of the previous forward date is assumed to continue "as-is".
2. If no balance change is specified for the first forward date, the spot balance is assumed to continue.

The following is an example for Balance Change Download:

**Input**:

| Product | Currency | N_EOP_BAL | N_EOP_BAL_RCY | N_EOP_BAL_LCY | N_AS_OF_DATE |
|---|---|---|---|---|---|
| Term Deposit | USD | 10000 | 10000 | 10000 | 12/31/2014 |
| Term Deposit | INR | 2000000 | 33333 | 2000000 | 12/31/2014 |

| Product | Currency | Balance Change Amount | Balance Change Amount Date | Forward Date |
|---|---|---|---|---|
| Term Deposit | USD | 26 | 1/1/2015 | 2/1/2015 |
| Term Deposit | USD | 66 | 1/2/2015 | 2/1/2015 |
| Term Deposit | USD | 21 | 1/5/2015 | 2/1/2015 |
| Term Deposit | USD | -52 | 1/6/2015 | 2/1/2015 |
| Term Deposit | USD | 62 | 1/7/2015 | 2/1/2015 |
| Term Deposit | USD | -95 | 1/8/2015 | 2/1/2015 |
| Term Deposit | USD | 0 | 1/9/2015 | 2/1/2015 |
| Term Deposit | USD | 0 | 1/12/2015 | 2/1/2015 |
| Term Deposit | USD | 0 | 1/13/2015 | 2/1/2015 |
| Term Deposit | USD | 0 | 1/14/2015 | 2/1/2015 |
| Term Deposit | USD | 78 | 1/15/2015 | 2/1/2015 |
| Term Deposit | USD | 43 | 1/16/2015 | 2/1/2015 |
| Term Deposit | USD | -79 | 1/19/2015 | 2/1/2015 |
| Term Deposit | USD | 57 | 1/20/2015 | 2/1/2015 |

| Product | Currency | Balance Change Amount | Balance Change Amount Date | Forward Date |
|---|---|---|---|---|
| Term Deposit | USD | 29 | 1/21/2015 | 2/1/2015 |
| Term Deposit | USD | -56 | 1/22/2015 | 2/1/2015 |
| Term Deposit | USD | 22 | 1/23/2015 | 2/1/2015 |
| Term Deposit | USD | 61 | 1/26/2015 | 2/1/2015 |
| Term Deposit | USD | 93 | 1/27/2015 | 2/1/2015 |
| Term Deposit | USD | -73 | 1/28/2015 | 2/1/2015 |
| Term Deposit | USD | 5 | 1/29/2015 | 2/1/2015 |
| Term Deposit | USD | 42 | 1/30/2015 | 2/1/2015 |
| Term Deposit | USD | 10 | 2/1/2015 | 2/1/2015 |
| Term Deposit | USD | 11 | 2/2/2015 | 3/1/2015 |
| Term Deposit | USD | 12 | 2/3/2015 | 3/1/2015 |
| Term Deposit | USD | 13 | 2/4/2015 | 3/1/2015 |
| Term Deposit | USD | 14 | 2/5/2015 | 3/1/2015 |
| Term Deposit | USD | 15 | 2/6/2015 | 3/1/2015 |
| Term Deposit | USD | 23 | 2/9/2015 | 3/1/2015 |
| Term Deposit | USD | 17 | 2/10/2015 | 3/1/2015 |
| Term Deposit | USD | 18 | 2/11/2015 | 3/1/2015 |
| Term Deposit | USD | 34 | 2/12/2015 | 3/1/2015 |
| Term Deposit | USD | 20 | 2/13/2015 | 3/1/2015 |
| Term Deposit | USD | 21 | 2/16/2015 | 3/1/2015 |

| Product | Currency | Balance Change Amount | Balance Change Amount Date | Forward Date |
|---|---|---|---|---|
| Term Deposit | USD | 22 | 2/17/2015 | 3/1/2015 |
| Term Deposit | USD | 23 | 2/18/2015 | 3/1/2015 |
| Term Deposit | USD | 24 | 2/19/2015 | 3/1/2015 |
| Term Deposit | USD | 3 | 2/20/2015 | 3/1/2015 |
| Term Deposit | USD | 26 | 2/23/2015 | 3/1/2015 |
| Term Deposit | USD | 27 | 2/24/2015 | 3/1/2015 |
| Term Deposit | USD | 28 | 2/25/2015 | 3/1/2015 |
| Term Deposit | USD | 29 | 2/26/2015 | 3/1/2015 |
| Term Deposit | USD | 3 | 2/27/2015 | 3/1/2015 |
| Term Deposit | USD | -10 | 3/1/2015 | 3/1/2015 |
| Term Deposit | INR | -41020 | 1/1/2015 | 2/1/2015 |
| Term Deposit | INR | 80810 | 1/2/2015 | 2/1/2015 |
| Term Deposit | INR | 35960 | 1/5/2015 | 2/1/2015 |
| Term Deposit | INR | -36810 | 1/6/2015 | 2/1/2015 |
| Term Deposit | INR | 76760 | 1/7/2015 | 2/1/2015 |
| Term Deposit | INR | -79960 | 1/8/2015 | 2/1/2015 |
| Term Deposit | INR | -15000 | 1/9/2015 | 2/1/2015 |
| Term Deposit | INR | -15000 | 1/12/2015 | 2/1/2015 |
| Term Deposit | INR | -15000 | 1/13/2015 | 2/1/2015 |
| Term Deposit | INR | -15000 | 1/14/2015 | 2/1/2015 |

| Product | Currency | Balance Change Amount | Balance Change Amount Date | Forward Date |
|---|---|---|---|---|
| Term Deposit | INR | -93350 | 1/15/2015 | 2/1/2015 |
| Term Deposit | INR | -58280 | 1/16/2015 | 2/1/2015 |
| Term Deposit | INR | -64150 | 1/19/2015 | 2/1/2015 |
| Term Deposit | INR | 72180 | 1/20/2015 | 2/1/2015 |
| Term Deposit | INR | 43710 | 1/21/2015 | 2/1/2015 |
| Term Deposit | INR | -40990 | 1/22/2015 | 2/1/2015 |
| Term Deposit | INR | 36810 | 1/23/2015 | 2/1/2015 |
| Term Deposit | INR | 75630 | 1/26/2015 | 2/1/2015 |
| Term Deposit | INR | 108470 | 1/27/2015 | 2/1/2015 |
| Term Deposit | INR | -58170 | 1/28/2015 | 2/1/2015 |
| Term Deposit | INR | 20060 | 1/29/2015 | 2/1/2015 |
| Term Deposit | INR | 56580 | 1/30/2015 | 2/1/2015 |
| Term Deposit | INR | 25000 | 2/1/2015 | 2/1/2015 |
| Term Deposit | INR | 26000 | 2/2/2015 | 3/1/2015 |
| Term Deposit | INR | 27000 | 2/3/2015 | 3/1/2015 |
| Term Deposit | INR | -28000 | 2/4/2015 | 3/1/2015 |
| Term Deposit | INR | -28000 | 2/5/2015 | 3/1/2015 |
| Term Deposit | INR | 280000 | 2/6/2015 | 3/1/2015 |
| Term Deposit | INR | -280000 | 2/9/2015 | 3/1/2015 |
| Term Deposit | INR | -28000 | 2/10/2015 | 3/1/2015 |

| Product | Currency | Balance Change Amount | Balance Change Amount Date | Forward Date |
|---|---|---|---|---|
| Term Deposit | INR | -28000 | 2/11/2015 | 3/1/2015 |
| Term Deposit | INR | -50000 | 2/12/2015 | 3/1/2015 |
| Term Deposit | INR | -50000 | 2/13/2015 | 3/1/2015 |
| Term Deposit | INR | -50000 | 2/16/2015 | 3/1/2015 |
| Term Deposit | INR | 50000 | 2/17/2015 | 3/1/2015 |
| Term Deposit | INR | -50000 | 2/18/2015 | 3/1/2015 |
| Term Deposit | INR | -50000 | 2/19/2015 | 3/1/2015 |
| Term Deposit | INR | -50000 | 2/20/2015 | 3/1/2015 |
| Term Deposit | INR | -50000 | 2/23/2015 | 3/1/2015 |
| Term Deposit | INR | -50000 | 2/24/2015 | 3/1/2015 |
| Term Deposit | INR | -50000 | 2/25/2015 | 3/1/2015 |
| Term Deposit | INR | 44000 | 2/26/2015 | 3/1/2015 |
| Term Deposit | INR | 18000 | 2/27/2015 | 3/1/2015 |
| Term Deposit | INR | 5000 | 3/1/2015 | 3/1/2015 |

**Output:**

| Product | Currency | N_EOP_BAL | N_EOP_BAL _LCY | N_EOP_BAL _RCY | D_FORWARD_DATE |
|---|---|---|---|---|---|
| Term Deposit | USD | 10260 | 10260 | 10260 | 2/1/2015 |
| Term Deposit | INR | 2099240 | 2099240 | 34987 | 2/1/2015 |
| Term Deposit | USD | 10633 | 10633 | 10633 | 3/1/2015 |
| Term Deposit | INR | 1707240 | 1707240 | 28454 | 3/1/2015 |

5. **Constant Balance**:

The current contractual balance is held constant for each of the forward dates.

The application calculates the forward dates required for a particular run using the forward date calculation. Once forward dates are determined the forecasted balance is calculated for all forward dates.

The constant balance method is illustrated below. The spot information is as follows:

| | |
|---|---|
| **As of Date** | 31-Dec-14 |
| **Product** | Term Deposit |
| **Currency** | USD |
| **Current Balance** | 1,000 |

The forward balance, in case of the constant balance method, is calculated as follows:

| Forward Date | Forward Balance |
|---|---|
| 1-Jan-15 | 1,000 |
| 1-Feb-15 | 1,000 |
| 1-Mar-15 | 1,000 |

| Forward Date | Forward Balance |
|---|---|
| 1-Apr-15 | 1,000 |
| 1-May-15 | 1,000 |

6. **Cash Flow Download Method**:

   This method computes the balances for each forward date by summing up the forward cash flows received as download for that forward date. Refer to section Forward Cash Flow Method Mapping Rule for more details.

### 13.1.5 Adjustment of Forward Balance Sheet

After computing the forward balances for all dimensional combinations, the application checks whether the total assets equal the total liabilities plus equity. If the total assets do not equal the total liabilities plus equity, an adjustment entry is made to balance the balance sheet, if specified by the user.

The application supports multiple methods for adjusting the balance sheet. The method to be used is determined through the selection of the balance sheet adjustment method in the Run Management window. Refer section Run Definition Parameters for more details.

The application supports the following four methods for adjusting the forward balance sheet.

- Current Profile Based Increase
- Current Profile Based Decrease
- Cash Adjustment
- Manual Adjustments

**NOTE:**

The adjustments are applied to forward balances prior to computing forward cash flows as part of the contractual Run.

#### 13.1.5.1 Current Profile Based Increase

This method increases the total value of the side of the balance sheet that is lower than the other side in the proportion of the current profile. Suppose the spot balance sheet position and the current profile is as follows:

| Assets Side | Asset Balance | Current Profile – Assets | Liabilities Side | Liability Balance | Current Profile – Liabilities | Liability Balance Excluding Equity | Revised Current Profile – Liabilities |
|---|---|---|---|---|---|---|---|
| Cash | 300 | 35.29% | Equity | 200 | 23.53% | | |
| Asset 2 | 250 | 29.41% | Liability 1 | 300 | 35.29% | 300 | 46.15% |
| Asset 3 | 200 | 23.53% | Liability 2 | 350 | 41.18% | 350 | 53.85% |
| Asset 4 | 100 | 11.76% | | | | | |
| Total | 850 | 100% | Total | 850 | 100% | 650 | 100% |

The balance sheet position after forward balance calculation is as follows:

- Total Assets = 1000
- Total Liabilities plus Equity = 1200

Here, the assets side is lower than the liabilities side by 200 (1200-1000). As per this method, the side which is lower is adjusted and made equal to the other side in order for the balance sheet to be balanced. The difference on the assets side is allocated based on the current asset profile as follows:

| Assets Side | Current Profile (a) | Forward Balance (b) | Adjustments to Assets (c = a* Difference) | Adjusted Forward Balance (d = b + c) |
|---|---|---|---|---|
| Cash | 35.29% | 350 | 70.58 | 420.58 |
| Asset 2 | 29.41% | 270 | 58.82 | 328.82 |

| Assets Side | Current Profile (a) | Forward Balance (b) | Adjustments to Assets (c = a* Difference) | Adjusted Forward Balance (d = b + c) |
|---|---|---|---|---|
| Asset 3 | 23.53% | 250 | 47.06 | 297.06 |
| Asset 4 | 11.76% | 130 | 23.52 | 153.52 |
| Total | 100.00% | 1000 | 200 | 1200 |

**NOTE:**

If the liabilities side is increased, equity is excluded from any adjustments. The total difference is only allocated to all liabilities other than equity, based on the revised current profile calculated for all liabilities excluding equity.

#### 13.1.5.2 Current Profile Based Decrease

This method decreases the total value of the side of the balance sheet that is higher than the other side in the proportion of the current profile. Based on the spot balance sheet position provided as part of the illustration above, the liabilities side is greater than the assets side and hence is reduced to match the assets side based on the current liability profile as follows:

| Liabilities Side | Revised Current Profile (a) | Forward Balance (b) | Adjustments to Liabilities (c = a* Difference) | Adjusted Forward Balance (d = b + c) |
|---|---|---|---|---|
| Equity | | 275 | 0 | 275.00 |
| Liability 1 | 46.15% | 530 | -92.30 | 437.70 |
| Liability 2 | 53.85% | 395 | -107.70 | 287.30 |
| Total | 100.00% | 1200 | -200 | 1000 |

**NOTE:**

If the liabilities side is being decreased, equity is excluded from any adjustments as illustrated above. The total difference is only allocated to all liabilities other than equity, based on the revised current profile calculated for all liabilities excluding equity.

#### 13.1.5.3 Cash Adjustment

This method increases or decreases the cash balance based on the side of the balance sheet which is greater. If the liabilities side is greater than the assets side after computing forward balances, then cash balance is increased by the difference amount. If the asset side is greater than the liabilities side, cash is decreased by the difference amount.

In the illustrations above, since the liabilities side is greater than the assets side, the cash balance is increased by 200, which is the difference amount. The adjusted forward cash balance is 550 (i.e. 350 + 200).

#### 13.1.5.4 Manual Adjustments

Manual adjustments method allows users to specify the percentages by which assets and/or liabilities are to be increased or decreased in order to adjust the balance sheet. The application provides a pre-configured sample rule named “LRM - Manual Balance Adjustment – Forecast” to achieve this. When the ‘manual adjustments’ option is selected as part of the balance sheet adjustment method selection in the contractual Run.

This rule appears for selection of the adjustment of the balance sheet position can be specified based on certain dimensional combination as part of this rule. The most granular combination of dimensions equals the download dimensions for forward date liquidity calculations. Users can modify this rule as per their specific adjustment criteria or create a new rule to specify these criteria. The adjustment percentage specified by the user is applied to the difference in the assets and liabilities side to compute the adjusted balance sheet. The various ways of specifying the manual adjustment criteria are illustrated below.

Illustration 1: Asset Adjustment Only

In this case, the manual adjustment is specified in such a manner that only the asset position changes. The adjustment percentages to be applied differ based on the condition.

| Condition | Asset | Currency | Adjustment Percentage |
|---|---|---|---|
| Assets > Liabilities | Asset 2 | US Dollar | - 20% |

| Condition | Asset | Currency | Adjustment Percentage |
|---|---|---|---|
| | Asset 3 | Euro | -30% |
| | Cash | US Dollar | -50% |
| Assets < Liabilities | Cash | US Dollar | 70% |
| | Asset 2 | US Dollar | 30% |

Illustration 2: Asset Or Liability Adjustment

In this case, either asset position or liability position is changed depending on the condition.

| Condition | Asset | Currency | Adjustment Percentage |
|---|---|---|---|
| Assets > Liabilities | Liability 1 | US Dollar | 55% |
| | Liability 1 | Euro | 45% |
| Assets < Liabilities | Cash | US Dollar | 70% |
| | Asset 2 | US Dollar | 30% |

Illustration 3: Liability Adjustment Only

In this case, only liability position is changed depending on the condition.

| Condition | Asset | Currency | Adjustment Percentage |
|---|---|---|---|
| Assets > Liabilities | Liability 1 | US Dollar | 55% |
| | Liability 1 | Euro | 45% |
| Assets < Liabilities | Liability 1 | US Dollar | -70% |
| | Liability 1 | US Dollar | -30% |

Illustration 4: Asset And Liability Adjustment

In this case, both asset and liability positions are adjusted depending on the condition.

| Condition | Asset | Adjustment Percentage |
|---|---|---|
| Assets > Liabilities | Asset 2 | -55% |
| | Liability 1 | 45% |
| Assets < Liabilities | Asset 2 | 70% |
| | Liability 1 | -30% |

Suppose the balance sheet position after forward balance calculation is as follows:

Total Assets = 1000

Total Liabilities plus Equity = 1200

Here, the assets side is lower than the liabilities side by 200 (1200-1000). As per the criteria specified in illustration 4, this meets condition 2 i.e. Assets < Liabilities. The difference on the assets side is adjusted as follows:

Asset 2 = 200 * 70% = 140

Liability 1 = 200 * -30% = -60

Total Adjusted Assets = 1000 + 140 = 1140

Total Adjusted Liabilities plus Equity = 1200 – 60 = 1140

## 13.1.6 Forward Balance and Cash Flow Allocation

### 13.1.6.1 Forward Balance Allocation

The application computes forward balances based on a limited set of dimensional combinations such product, currency, customer type legal entity and facility type (refer section Granularity of Forward Records for granularity of forward records) as the information is generally not available at a very granular level for dates in the future. However, for the purpose of computing LCR, the information is required at a

very granular level. To overcome this mismatch in granularity, the application allocates the adjusted forward balances to the granularity required for computing forward LCR as follows:

1. The dimensional combinations to which forward balance methods are mapped are identified.
2. The dimensional combination to which each forward balance is to be allocated is identified. The allocation granularity is the dimensions that are available as part of the FSI LRM Instrument table.
3. The application computes the current profile of all spot data, which corresponds to each download dimensional combination, at the granularity available in FSI LRM Instrument table i.e. the allocation dimension granularity.
4. The application applies the current profile percentage calculated as part of step 3 to the corresponding forward balances computed at the download dimension level to compute the allocation amount.

   The forward balance allocation process is illustrated below. Suppose the forward balance is being computed at the Product – Customer Type dimensional combination. The current balance obtained as a download and forward balance computed for this dimensional combination are follows:

| **Product** | **Customer Type** | **Current EOP Balance (a)** | **Current Insured Balance (b)** | **Forward Balance (c)** |
|---|---|---|---|---|
| Deposits | Retail | 1000 | 600 | 1200 |
| Loans | SME | 2000 | | 1500 |

This illustration assumes that the most granular dimensional combination for computation is Product – Customer Type – Currency. The current balance available for this granular dimensional combination is provided below. The application computes the current profile and allocates balance to the granular combinations as follows:

| **Input** | | | | | **Calculation** | | | |
|---|---|---|---|---|---|---|---|---|
| **Product** | **Customer Type** | **Currency** | **Current EOP Balance (d)** | **Current Insured Balance (e)** | **Current Profile - EOP Balance [f = d ÷ a]** | **Allocated Forward EOP Balance (c * f)** | **Current Profile - Insured Balance [g = e ÷ a]** | **Allocated Forward Insured Balance (c * g)** |
| Deposits | Retail | USD | 800 | 450 | 80% | 960 | 45% | 540 |
| Deposits | Retail | GBP | 200 | 150 | 20% | 240 | 15% | 180 |
| Loans | SME | USD | 900 | | 45% | 675 | | |
| Loans | SME | GBP | 1100 | | 55% | 825 | | |

**NOTE:**

The allocation of liquidity pool balances are based on the Fair Value and not the EOP Balance. For all other products the balance allocation is done on the basis of EOP Balance.

### 13.1.6.2 Forward Cash Flow Allocation

In case of the Cash Flow Download method, the cash flows are obtained at a less granular level i.e. at the level specified in section Granularity of Forward Records. The application allocates these cash flows to the granularity required for computing LCR. The steps involved in allocating cash flows to a more granular level are as follows:

1. The dimensional combinations based on which Cash Flow Download method is mapped are identified.

2. The cash flows obtained as of each forward date are bucketed based on the Time Bucket Definition selected as part of the forward date liquidity risk Run.
3. The dimensional combination to which each forward cash flow is to be allocated is identified. The allocation granularity is the dimensions that are available as part of the Fact Aggregate Cash Flow table.
4. The application computes the current profile of all spot cash flows, which corresponds to each download dimensional combination, at the granularity available in Fact Aggregate Cash Flow table i.e. the allocation dimension granularity including the level 0 time bucket.
5. The application applies the current profile percentage calculated as part of step 4 to the corresponding forward cash flows computed at the download dimension level to compute the allocation amount. The granularity of allocation is the same as that available in Fact Aggregate Cash Flow table.

The forward cash flow allocation process is illustrated below. Suppose the following forward cash flows are obtained at the Product – Customer Type dimensional combination as of the forward date 25th February 2016:

| Product | Customer Type | Forward Cash Flow Date | Forward Cash Flows |
|---|---|---|---|
| Loans | Retail | 26-Feb-15 | 15 |
| Loans | Retail | 27-Feb-15 | 20 |
| Loans | SME | 26-Feb-15 | 30 |
| Loans | SME | 27-Feb-15 | 15 |

The bucketed current cash flows and forward cash flows for this dimensional combination are as follows:

| Inputs | | | | Calculation | |
|---|---|---|---|---|---|
| Product | Customer Type | Current Cash Flows | | Forward Cash Flows | |
| | | 1-1 Day (a) | 2-2 Day (b) | 1-1 Day (c) | 2-2 Day (d) |

| Inputs | | | | Calculation | |
|---|---|---|---|---|---|
| Product | Customer Type | Current Cash Flows | | Forward Cash Flows | |
| | | 1-1 Day (a) | 2-2 Day (b) | 1-1 Day (c) | 2-2 Day (d) |
| Loans | Retail | 10 | 25 | 15 | 20 |
| Loans | SME | 20 | 15 | 30 | 15 |

This illustration assumes that the most granular dimensional combination for computation is Product – Customer Type – Currency. The current cash flow available for this granular dimensional combination is provided below. The application computes the current profile and allocates forward cash flows to the granular combinations as follows:

| Inputs | | | | | Calculation | | | |
|---|---|---|---|---|---|---|---|---|
| Product | Customer Type | Currency | Current Cash Flow | | Current Profile | | Allocated Forward Cash flow | |
| | | | 1-1 Day (e) | 2-2 Day (f) | 1-1 Day [g = e ÷ a] | 2-2 Day [h= f ÷ b] | 1-1 Day (c * g) | 2-2 Day (d * h) |
| Loans | Retail | USD | 5 | 10 | 0.50 | 0.40 | 7.50 | 8.00 |
| Loans | Retail | GBP | 5 | 15 | 0.50 | 0.60 | 7.50 | 12.00 |
| Loans | SME | USD | 9 | 9 | 0.45 | 0.60 | 13.50 | 9.00 |
| Loans | SME | GBP | 11 | 6 | 0.55 | 0.40 | 16.50 | 6.00 |

**NOTE:**

This allocation process is applicable only when the cash flow calculation method is selected as ‘Cash Flow Download’

### 13.1.7 Calculation of Forward Cash Flows

The application, as part of contractual Run, calculates forward cash flows based on the balances computed as of each forward date. It supports multiple methodologies for computing these forward cash flows which include:

- Contractual Profile
- Current Profile
- Current and Default Profile
- Cash Flow Download
- Incremental Run-off Assumption
- Growth Assumption
- Drawdown Assumption

The application allows users to map the forward cash flow calculation methods to the desired dimensional combinations such as product-currency or simply a single dimension such as product through a rule defined as part of the Rule Run Framework. The application supports a pre-configured rule for mapping the forward cash flow calculation methods named LRM - Cash Flow Method Reclassification - Forecast. This has default values mapped for assets and liabilities. These default mappings can be changed by the users and the rule can be re-saved to reflect these changes. Alternatively, users can create their own cash flow method mapping rules in the Rules Framework to address regulatory and risk management needs. However, only one mapping rule is allowed to be selected in the Run Management window for a given forward liquidity Run, based on which all further calculations are done as part of that forward Run. The application looks up the method for each dimensional combination and calculates the forward cash flows for each record based on the user-specified method,

The forward cash flow calculation methods supported by the application are explained in detail below:

#### 13.1.7.1 Contractual Profile

The steps involved in calculating cash flows at a forward date under contractual terms when the method is selected as “Contractual Profile” are as follows:

1. The un-bucketed contractual cash flows as of the current date are obtained as a download. The current date is equal to the As of Date selected during Run execution.

2. The contractual cash flows prior to or on the forward date are excluded and the contractual cash flows occurring after the forward date are considered the forward cash flows.

   For example, the current date is taken as 28th February 2016 and the contractual cash flows for an account as of the current date are as follows:

| **Cash Flow Date** | 28-Mar-16 | 28-Apr-16 | 28-May-16 | 28-Jun-16 | 28-Jul-16 |
|---|---|---|---|---|---|
| **Cash Flow** | 80 | 70 | 60 | 50 | 40 |

   Under the contractual profile method, the cash flows as of the forward date 28th April 2016 are calculated as follows:

| **Cash Flow Date** | 28-May-16 | 28-Jun-16 | 28-Jul-16 |
|---|---|---|---|
| **Cash Flow** | 60 | 50 | 40 |

**NOTE:**

The cash flow calculation method 'Contractual Profile' is applicable only when the forward balance calculation method is selected as 'Contractual Run-off'.

Only the principal cash flows are taken into account for forward liquidity calculations. Interest cash flows as of the current date are ignored.

### 13.1.7.2 Current Profile

The steps involved in calculating cash flows at a forward date under contractual terms when the method is selected as "Current Profile" are as follows:

1. The un-bucketed contractual cash flows as of the current date are obtained as a download. The current date is equal to the As of Date selected during Run execution.
2. The application calculates the current maturity profile of cash flows for each dimensional combination as follows:

$$\boldsymbol{Current\ Profile}_{x} = \frac{\boldsymbol{Cash\ Flow}_{x}}{\boldsymbol{EOP\ Balance}} \times \mathbf{100}$$

Where,

x : Day in which the contractual cash flow occurs from 1 to n

3. The application applies the current maturity profile percentage to each forward balance to obtain the forward cash flows as follows:

$$\boldsymbol{Forward\ Cash\ Flow_x = Forward\ Balance_f \times Current\ Profile_x}$$

Where,

f : Forward dates from 1 to n

The current profile method is illustrated below. The inputs required for this method are provided below:

| | |
|---|---|
| **As of Date (a)** | 28-Feb-16 |
| **EOP Balance (b)** | 10000 |
| **Forward Date 1 (c)** | 15-Apr-16 |
| **Forward EOP Balance 1 (d)** | 8000 |
| **Forward Date 2 (e)** | 17-Apr-2016 |
| **Forward EOP Balance 2 (f)** | 8900 |

The application computes the current profile and subsequently the forward cash flows as of each forward date as follows:

| **Inputs** | | **Calculation** | | | | | |
|---|---|---|---|---|---|---|---|
| **Cash Flow Date (g)** | **Cash Flows (h)** | **Current Profile [i = (h ÷ b) * 100]** | **Calendar Day [j = (g – a)]** | **Forward Cash Flows as of 15-Apr-2016** | | **Forward Cash Flows as of 17-Apr-2016** | |
| | | | | **Forward Cash Flow Date (c + j)** | **Forward Cash Flows (d * i)** | **Forward Cash Flow Date (e + j)** | **Forward Cash Flows (f * i)** |
| 1-Mar-16 | 979.00 | 9.79% | 2 | 17-Apr-16 | 783.20 | 19-Apr-16 | 871.31 |
| 2-Mar-16 | 496.00 | 4.96% | 3 | 18-Apr-16 | 396.80 | 20-Apr-16 | 441.44 |
| 3-Mar-16 | 377.00 | 3.77% | 4 | 19-Apr-16 | 301.60 | 21-Apr-16 | 335.53 |
| 4-Mar-16 | 520.00 | 5.20% | 5 | 20-Apr-16 | 416.00 | 22-Apr-16 | 462.80 |
| 7-Mar-16 | 718.00 | 7.18% | 8 | 23-Apr-16 | 574.40 | 25-Apr-16 | 639.02 |
| 8-Mar-16 | 95.00 | 0.95% | 9 | 24-Apr-16 | 76.00 | 26-Apr-16 | 84.55 |
| 9-Mar-16 | 226.00 | 2.26% | 10 | 25-Apr-16 | 180.80 | 27-Apr-16 | 201.14 |
| 10-Mar-16 | 105.00 | 1.05% | 11 | 26-Apr-16 | 84.00 | 28-Apr-16 | 93.45 |
| 11-Mar-16 | 1035.00 | 10.35% | 12 | 27-Apr-16 | 828.00 | 29-Apr-16 | 921.15 |
| 14-Mar-16 | 726.00 | 7.26% | 15 | 30-Apr-16 | 580.80 | 2-May-16 | 646.14 |
| 15-Mar-16 | 444.00 | 4.44% | 16 | 1-May-16 | 355.20 | 3-May-16 | 395.16 |
| 16-Mar-16 | 333.00 | 3.33% | 17 | 2-May-16 | 266.40 | 4-May-16 | 296.37 |
| 17-Mar-16 | 335.00 | 3.35% | 18 | 3-May-16 | 268.00 | 5-May-16 | 298.15 |
| 18-Mar-16 | 508.00 | 5.08% | 19 | 4-May-16 | 406.40 | 6-May-16 | 452.12 |

| Inputs | | Calculation | | | | | |
|---|---|---|---|---|---|---|---|
| Cash Flow Date (g) | Cash Flows (h) | Current Profile [i = (h ÷ b) * 100] | Calendar Day [j = (g – a)] | Forward Cash Flows as of 15-Apr-2016 | | Forward Cash Flows as of 17-Apr-2016 | |
| | | | | Forward Cash Flow Date (c + j) | Forward Cash Flows (d * i) | Forward Cash Flow Date (e + j) | Forward Cash Flows (f * i) |
| 21-Mar-16 | 270.00 | 2.70% | 22 | 7-May-16 | 216.00 | 9-May-16 | 240.30 |
| 22-Mar-16 | 414.00 | 4.14% | 23 | 8-May-16 | 331.20 | 10-May-16 | 368.46 |
| 23-Mar-16 | 209.00 | 2.09% | 24 | 9-May-16 | 167.20 | 11-May-16 | 186.01 |
| 24-Mar-16 | 310.00 | 3.10% | 25 | 10-May-16 | 248.00 | 12-May-16 | 275.90 |
| 25-Mar-16 | 371.00 | 3.71% | 26 | 11-May-16 | 296.80 | 13-May-16 | 330.19 |
| 28-Mar-16 | 564.00 | 5.64% | 29 | 14-May-16 | 451.20 | 16-May-16 | 501.96 |
| 29-Mar-16 | 965.00 | 9.65% | 30 | 15-May-16 | 772.00 | 17-May-16 | 858.85 |

**NOTE:**

The current profile can be computed on the basis of calendar days or business days.

#### 13.1.7.3 Current and Default Profile

The current and default profile method is a combination of the current profile method and the incremental run-off method of generating cash flows. In this method, the cash flows are generated for some forward dates based on the current profile method and for others based on the default cash flow profile specified by the user as part of the incremental cash flow business assumption. Both these methods are used for generating cash flows for the same dimensional combination. However, only one method is applicable for a given forward date within a single Run execution.

For example, the current profile method can be used to generate cash flows for all forward dates occurring within the next 30 calendar days and default profile method for all forward dates later than 30 days. This is specified as part of the rule named "LRM - Cash Flow Method Reclassification - Forecast". Considering the As of Date to be 28th February 2016 and the forward liquidity calculations are being executed for 6 forward dates which are at weekly intervals starting 1st March 2016, the cash flow methodology applicable for each forward date is determined as follows:

| Forward Date | Days from As of Date | Cash Flow Calculation Method Applied |
|---|---|---|
| 1-Mar-16 | 2 | Current Profile |
| 8-Mar-16 | 9 | Current Profile |
| 15-Mar-16 | 16 | Current Profile |
| 22-Mar-16 | 23 | Current Profile |
| 29-Mar-16 | 30 | Current Profile |
| 5-Apr-16 | 37 | Default Profile |

The process of generating forward cash flows based on the current profile method is documented as part of the Current Profile section above. The process of generating forward cash flows based on the default profile method is available as part of the Incremental Run-off Assumption section below.

#### 13.1.7.4 Cash Flow Download

The forward cash flows as of each forward date are taken as a download at the dimensional combination specified in section Granularity of Forward Records. These cash flows, which are obtained as a download at a less granular level, are allocated by the application to the level of granularity required for computing LCR. Cash flow download method is applicable only in when the balance forecasting method selected is either 'Balance Download' or 'Balance Change Download'.

#### 13.1.7.5 Incremental Run-off Assumption

This method involves leveraging the existing incremental run-off business assumption to apply user-specified run-off pattern on the forward balances in order to generate forward cash flows based on user-specified pattern. The run-off rates for each time bucket are specified through the business assumption definition window by selecting the assumption category as 'Incremental cash flow' and sub category as 'Run-off'.

The user is allowed to select one or multiple incremental cash flow business assumptions as part of the forward date contractual Run definition UI. For the purpose of forward cash flow calculations, the only allowable 'Based On' measure is EOP balance i.e. only those assumptions which are based on EOP balance are displayed for selection as part of the contractual Run in the Run Management window. This restriction does not apply to business-as-usual or stress Runs. The application applies the user-specified run-off rates to each forward balance to compute cash flows as of each forward date. Refer to section Run-off for further details on defining the incremental run-off business assumption.

#### 13.1.7.6 New Business Assumption

This method involves leveraging the existing business assumption, new business, to generate cash flows due to business growth over and above the baseline forward cash flows computed by the application. For instance, the cash flow computation method may be selected as Contractual Run-off for a given product. This method considers only the current contractual cash flows occurring beyond the forward date. In this case, users can specify new business over and above the current business using the New Business assumption. The initial cash flows due to new business and subsequent off-set cash flows signifying repayment of assets or liabilities are specified through the business assumption definition window by selecting the assumption category as 'Incremental cash flow' and sub category as 'New Business'.

The user is allowed to select one or multiple new business assumptions as part of the forward date contractual Run definition UI. For the purpose of forward cash flow calculations, the only allowable 'Based On' measure is EOP balance i.e. only those assumptions which are based on EOP balance are displayed for selection as part of the contractual Run in the Run Management window. This restriction does not apply to business-as-usual or stress Runs. The application applies the user-specified growth and off-set rates to each forward balance to compute additional

cash flows as of each forward date. Refer to section New Business for further details on defining the new business assumption

#### 13.1.7.7 Drawdown Assumption

This method involves leveraging the existing drawdown business assumption to specify additional drawdown of the undrawn commitments and lines. The drawdown rates and corresponding repayment rates for each time bucket are specified through the business assumption definition window by selecting the assumption category as 'Incremental cash flow' and sub category as 'Drawdown'.

The user is allowed to select one or multiple drawdown assumptions as part of the forward date contractual Run definition UI. For the purpose of forward cash flow calculations, the only allowable 'Based On' measure is Undrawn Amount i.e. only those assumptions which are based on undrawn amount are displayed for selection as part of the contractual Run in the Run Management window. This restriction does not apply to business-as-usual or stress Runs. The application applies the user-specified drawdown and off-set rates to each forward undrawn balance to compute additional cash flows as of each forward date. Refer to section Drawdown for further details on defining the drawdown assumption.

### 13.1.8 Calculation of Forward Liquidity Coverage Ratio

Once the forward balances and cash flows are computed for multiple forward dates as part of the forward date liquidity risk contractual Run, the application computes the Liquidity Coverage Ratio (LCR) in a manner similar to that followed for the spot calculations currently. The calculation of LCR is done as part of the BAU Run where the regulatory scenario is applied and its impact on inflows, outflows and stock of HQLA is assessed. The application currently supports forward LCR calculation as per US Federal Reserve and the pre-packaged US regulatory scenario can be used to compute forward LCR under regulatory inflow and outflow rates. For details on LCR computations as per US Federal Reserve, refer to section US Federal Reserve, in the OFS LRM Regulatory Calculations User Guide Release 8.0.6.0.0 on OHC documentation Library.

The application also allows users to apply stress scenarios over and above the baseline regulatory scenario in order to assess the impact of stress of varying magnitudes on a bank's LCR. This is as per the current stress testing functionality supported by OFS Liquidity Risk Management. Refer to section Run Type for further details on stress testing.

### 13.1.9 Pre-configured Forecasting Rules

The following are the three different rules which have been preconfigured for forecasting:

- Cash Flow Calculation Method
- Balance Calculation Method
- Manual Adjustments

#### 13.1.9.1 Cash Flow Calculation Method

In the Run Definition window, Include Forward Date Calculations is selected as Yes and the Forward Cash Flow Method Mapping Rule is selected as LRM – Cash Flow Method Reclassification.

The Out of Box Rule name is “LRM - Cash Flow Method Reclassification – Forecast”.

The Out of Box rule has sample mappings and it is expected to change the mapping as per the requirement.

The list of mandatory source dimensions for Cash Flow Calculation rule is as follows:

- Standard Product Type
- Legal Entity
- Currency

The above source dimensions are mapped to “Forward Method Type”, which is the target dimension.

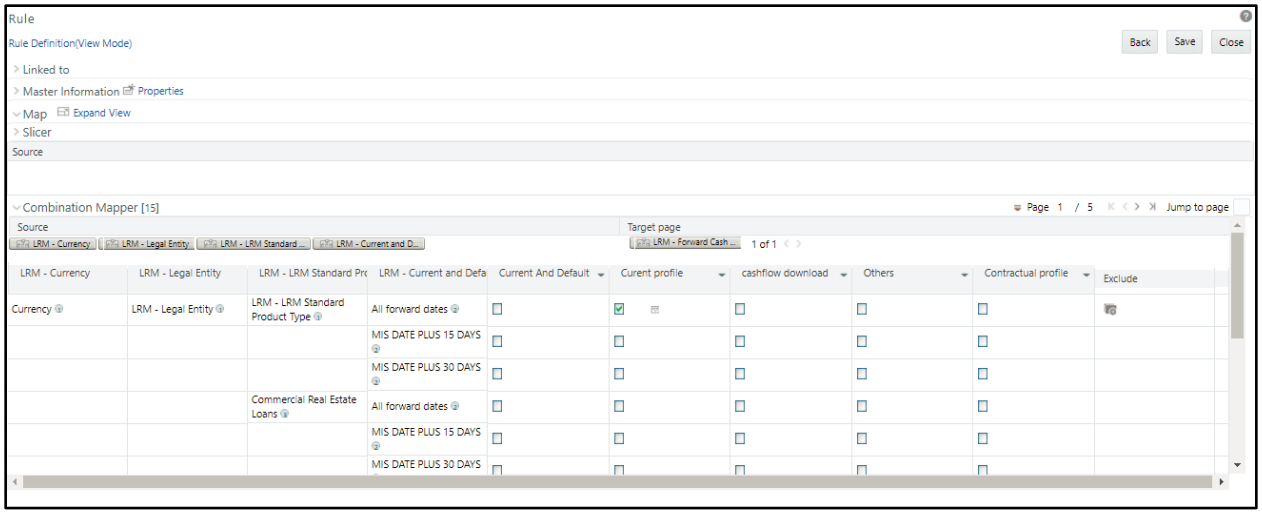
The additional Dimension – “LRM- Current and Default Method – Forecast” (Source hierarchy) must be selected when you wish to map “Current and Default Profile” method to any of the dimensions (product, currency and legal entity).

For Cash Flow Calculation, the following methods are available from the Liquidity Risk Management > Manage LRM Rules > Rule > Run Definition window:

- Contractual Profile
- Current Profile
- Current and Default Profile
- Cash Flow Download

The additional Dimension – “LRM- Current and Default Method – Forecast” (Source hierarchy) must be selected when you wish to map “Current and Default Profile” method to any of the dimensions (product, currency and legal entity).

This hierarchy contains MIS Date plus number of days which is mapped to Current and Default Profile.




### 13.1.9.2 Balance Calculation Method

In the Run Definition window, Include Forward Date Calculations is selected as Yes and the Forward Balance Method Mapping Rule is selected as LRM – Balance Method Reclassification.

The Out of Box Rule name is “LRM - Balance Method Reclassification – Forecast”.

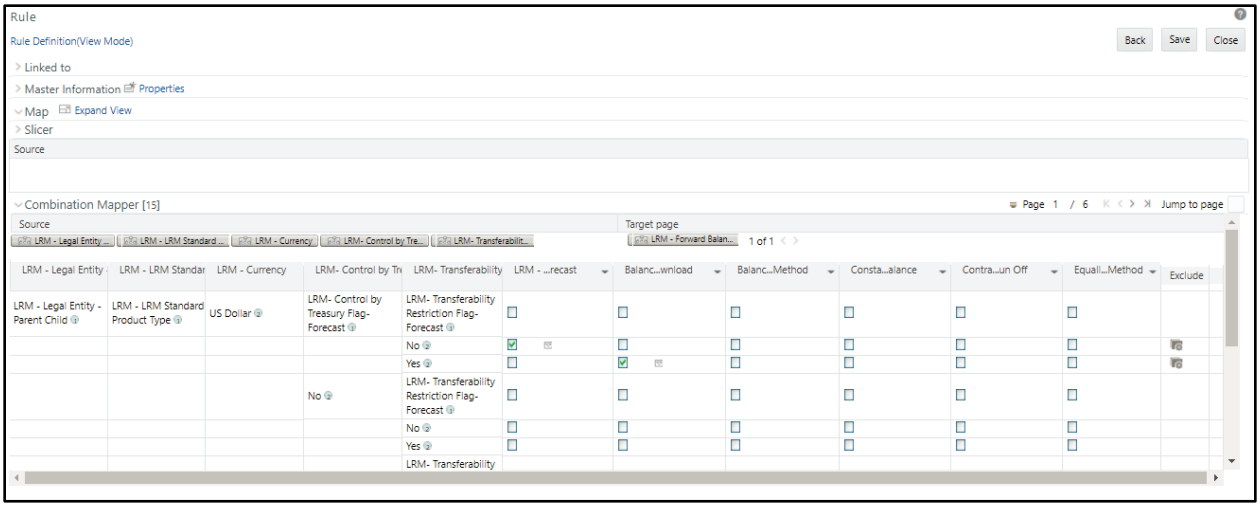
The Out of Box rule has sample mappings and it is expected to change the mapping as per the requirement

The list of mandatory source dimensions for this rule is follows:

- Standard Product Type
- Legal Entity
- Currency
- Transferability Restriction
- Control By Treasury Flag.

These are mapped to the target dimension “Forward Balance Method Type”. For Balance Calculation, following methods are available from the Liquidity Risk Management > Manage LRM Rules > Rule > Run Definition window:

- Contractual Run Off
- Equally Changing Balance
- Balance Download
- Balance Change Download
- Constant Balance
- Cash Flow Download Method




### 13.1.9.3 Manual Adjustments Rule

In the Run Definition window, **Include Forward Date Calculations** is selected as **Yes** and the **Balance Sheet Adjustment Method** is selected as **Manual Adjustment** then, the rule for Manual Balance Adjustment has to be selected.

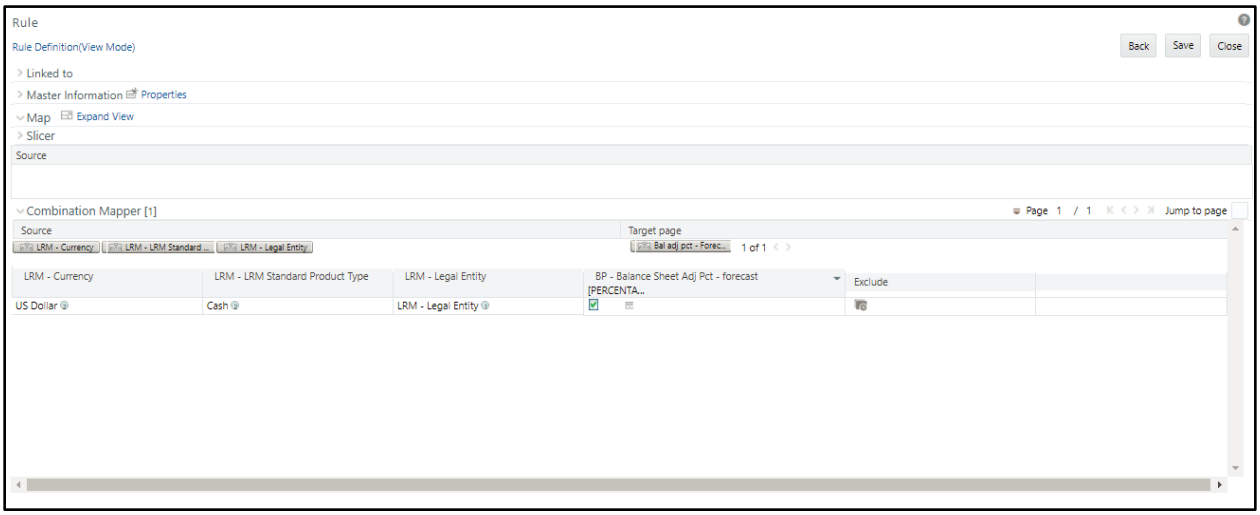
The Out of Box Rule name is “LRM - Manual Balance Adjustment – Forecast”.

The list of mandatory source dimensions for this rule is as follows:

- Standard Product Type
- Legal Entity
- Currency

The Out of Box rule has sample mapping and values in the target. The Manual Adjustment percentage (the target BP, a parameterized BP) is an input as per the requirement.

The sum total of the Manual Adjustment percentage has to be 100%.



You can also create new rules as per the procedure to replace the existing pre-configure forecasting rules. However, these rules must be mapped in the set up master table. The new rules are seeded in FSI_LRM_FWD_METHOD_RULES. Once it is available in the set up master table then, it will be available in the Method selection drop downs in Run Management window for selection.

| | V_RULE_TYPE | V_RRF_RULE_OBJECT_ID |
|---|---|---|
| **Manual Balance Adjustment Rule** | BAL_ADJ_RULE | LRMFRULE019 |
| **Forward Balance Calculation Rule** | FWD_BAL_RULE | LRMFRULE034 |
| **Forward Cash Flow Calculation Rule** | FWD_CF_RULE | LRMFRULE040 |

# 14 Intraday Liquidity Management

Intraday Monitoring metrics as prescribed by The BIS and Reserve Bank of India are computed by the LRM Application through a Run at the end of each day. Dashboard Reports and Regulatory Reports are displayed as a part of computations based on this Run.

Intraday monitoring metrics are calculated for each selected date based on actual data of Payments made and received as part of the Contractual Run. The LRM Application supports the following metrics as a part of Intraday Run:

**I. Metrics Applicable for All Reporting banks**

1. Daily Maximum Intraday Liquidity Usage
2. Available Intraday Liquidity at the Start of the Business Day
3. Total Payments
4. Time-specific Obligations

**II. Metrics Applicable for Banks providing Correspondent banking Services**

5. Value of Payments Made on Behalf of Correspondent Banking Customers
6. Intraday Credit Lines Extended to Customers

III. **Metrics Applicable to Banks which are direct participants of a Large Value Payment System**

7. Intraday Throughput

## 14.1 Intraday Metrics Calculation

### 14.1.1 Consolidated Payment System Run

If multiple payment systems are interconnected by liquidity bridges or if there is any provision to move intraday liquidity freely between payments systems, then transactions of such payment systems can be combined and reported against a single system. In v8.1, the application provides an option to the user to report intraday metrics in either standalone form (each payment system separately) or consolidated form (consolidate all systems wherein intraday liquidity moves freely).

Payment system consolidation is independent of legal entity consolidation which is already a feature in the application. For the Run purpose ‘Intraday metrics calculation’, ‘Consolidation type’ and ‘consolidation level’ labels are renamed as ‘Legal entity consolidation type’ and ‘legal entity consolidation level’ For payment system consolidation, there is an additional option in the Run Management window, ‘Payment system consolidation type’ to select either standalone Payment system or Consolidated Payment System. Consolidation of payment systems is explained through the example below:

For example, A legal entity has 4 payment systems (1 to 4) out of which system 2 is linked to system 1, system 1 is designated as the primary payment system, and system 3 and 4 are not linked to any system ;

If user chooses standalone, all 4 payment systems will be reported separately under their own names and own time zones

If user chooses consolidated, then reporting would be done for system 1, 3 and 4 in their respective time zones, wherein system 2's transactions are subsumed under system 1.

While providing mapping, user is required to designate a primary payment system to which other payment systems may be linked. In case of consolidated payment system reporting, reporting would be done only for primary payment systems- in the time zone of the primary system.

For each payment system, the time stamp taken is with respect to that particular payment system. While doing the mapping between the payment systems, the time standard of that particular payment system is considered.

### 14.1.2 Daily Maximum Intraday Liquidity Usage

This metric computes the maximum liquidity that a bank needs at any point during the day. This is calculated by cumulating the actual liquidity gaps in each time instance and identifying the largest positive and negative cumulative values during the day. The largest positive value represents the maximum inflow and largest negative value represents the maximum outflow.

This metric uses time buckets feature and is computed at level zero bucket level always.

The following are the steps involved in calculating this metric:

1. The application obtains the actual time-stamped intraday payments data and arranges in chronological order.
2. The inflows and outflows at each time bucket are aggregated separately.
3. The net cash flow at each instant as the difference between the payments received and payments sent are calculated.
4. The cumulative net usage at each time instant is calculated.
5. The largest positive net cumulative position is identified as the daily maximum cumulative positive net position and the largest negative net cumulative position as the daily maximum cumulative negative net position

   The following is an example for this metric:

For instance, if a bank has to settle the following 8 payments Intraday:

| Sl. No. | Payments | Details |
|---|---|---|
| 1 | 19 | |
| 2 | 223 | Paid on behalf of a customer bank to which it has extended a |

| Sl. No. | Payments | Details |
|---|---|---|
| | | secured line of credit of $500 |
| 3 | 99 | To be settled by 11:00 |
| 4 | 108 | To settle obligations in an auxiliary net retail payment system |
| 5 | 10 | |
| 6 | 45 | To be settled by 14:00 |
| 7 | 379 | |
| 8 | 11 | |

The intraday transactions that occurred in the payment and settlement system are as follows:

| Cash Flow Timing | Inflows | Outflows |
|---|---|---|
| 9:00 | 223 | |
| 9:30 | | 19 |
| 10:00 | 95 | |
| 10:15 | | 223 |
| 10:45 | | 99 |
| 11:00 | | 108 |
| 12:00 | 400 | |
| 12:35 | 22 | |
| 14:00 | | 10 |
| 14:05 | 5 | |
| 14:20 | | 45 |
| 15:00 | | 379 |
| 15:30 | 102 | |
| 17:00 | | 11 |

The daily maximum Intraday liquidity usage is calculated as follows:

| Time Bucket | Inflows | Outflows | Net Position | Cumulative Position |
|---|---|---|---|---|
| 9:00 | 223 | 0 | 223 | 223 |
| 9:30 | 0 | 19 | -19 | 204 |
| 10:00 | 95 | 0 | 95 | 299 |
| 10:15 | 0 | 223 | -223 | 76 |
| 10:45 | 0 | 99 | -99 | -23 |
| 11:00 | 0 | 108 | -108 | -131 |
| 12:00 | 400 | 0 | 400 | 269 |
| 12:35 | 22 | 0 | 22 | 291 |
| 14:00 | 0 | 10 | -10 | 281 |
| 14:05 | 5 | 0 | 5 | 286 |
| 14:20 | 0 | 45 | -45 | 241 |
| 15:00 | 0 | 379 | -379 | -138 |
| 15:30 | 102 | 0 | 102 | -36 |
| 17:00 | 0 | 11 | -11 | -47 |

Here,

- Largest Positive Net Cumulative Position: $299
- Largest Negative Net Cumulative Position: $138

This metric is reported for each LVPS and for each currency.

### 14.1.3 Available Intraday Liquidity at the Start of the Business Day

This metric computes and reports intraday funding that is available to banks at the start of a business day to meet its intraday liquidity needs throughout the day. All the balances and market values for all products under this category are taken as at the start of each day. This metric is calculated at a Legal Entity (solo/consolidated) - Currency granularity.

The following are the steps involved in calculating this metric:

1. Identification of intraday eligible sources for each product; as defined by the user.
2. Addition of Intraday Eligible sources across all products to arrive at the final value.

OFS LRM Application computes the following as a part of this metric:

1. Intraday liquidity available at the start of each business day
2. Average value of (1) above within a Reporting period
3. First, Second and Third minimum values of (1) above during the Reporting period
    a. Each report provides the constituent elements of the liquidity sources available to the bank. The constituent elements as a part of this metric is as follows: Central Bank reserves
    b. Collateral pledged at Central bank
    c. Collateral pledged at Ancillary systems
    d. Collateral pledged at Correspondent bank
    e. Unencumbered liquid assets on the balance sheet
    f. Total credit lines from Correspondent bank
        i. Of which secured
        ii. Of which committed
    g. Other Total credit lines available
        i. Of which secured
        ii. Of which committed
    h. Balance with the correspondent bank
    i. Balances with other banks
    j. Other

### 14.1.4 Total Payments

This metric calculates the total payment to be made which is the summation of intraday payments sent (outflows) and received (inflows).

The following is an example for this metric:

For instance, a bank has the following intraday transactions that occurred in the payment and settlement system:

| Cash Flow Timing | Inflows | Outflows |
|---|---|---|
| 9:00 | 223 | |
| 9:30 | | 19 |
| 10:00 | 95 | |
| 10:15 | | 223 |
| 10:45 | | 99 |

| Cash Flow Timing | Inflows | Outflows |
|---|---|---|
| 11:00 | | 108 |
| 12:00 | 400 | |
| 12:35 | 22 | |
| 14:00 | | 10 |
| 14:05 | 5 | |
| 14:20 | | 45 |
| 15:00 | | 379 |
| 15:30 | 102 | |
| 17:00 | | 11 |

Here,

Total Payments Sent = $894 (i.e. $19+$430+$10+$424+$11)

Total Payments Received = $847 (i.e. $223+$95+$400+$22+$5+$102)

### 14.1.5 Time-specific Obligations

This metric calculates the time-specific and critical obligations like payments that result in financial penalty, reputational damage or loss of future business if not serviced in time. Time specific obligations are payments that have to be made at or by a particular time.

The following is an example for this metric:

For instance, Bank A has to settle the following 8 payments Intraday:

| SN | Payments | Details | Time-specific obligation flag |
|---|---|---|---|
| 1 | 19 | | No |
| 2 | 223 | Paid on behalf of a customer bank to which it has extended a secured line of credit of $500 | No |
| 3 | 99 | To be settled by 11:00 | Yes |
| 4 | 108 | To settle obligations in an auxiliary net retail payment system | Yes |
| 5 | 10 | | No |
| 6 | 45 | To be settled by 14:00 | Yes |
| 7 | 379 | | No |
| 8 | 11 | | No |

The intraday transactions that occurred in the payment and settlement system are as follows:

| SN | Cash Flow Timing | Payments Sent | Time-specific obligation flag | Success Flag |
|---|---|---|---|---|
| 1 | 9:30 | 19 | No | NA |
| 2 | 10:15 | 223 | No | NA |
| 3 | 10:45 | 99 | Yes | Yes |
| 4 | 11:00 | 108 | Yes | Yes |
| 5 | 14:00 | 10 | No | NA |
| 6 | 14:20 | 45 | Yes | No |
| 7 | 15:00 | 379 | No | NA |
| 8 | 17:00 | 11 | No | NA |

The following metrics are calculated on actual time basis:

| SN | Reporting Requirement | Output as per Illustration |
|---|---|---|
| 1 | Total Number of Time-Specific and Other Obligations | Total number is 3 obligations<br>(SN 3, 4 and 6) |
| 2 | Total Value of Time-Specific and Other Obligations | This value is $252<br>(i.e. $99 + $108 + $45) |
| 3 | Total Number of Time-Specific and Other Obligations Settled | Total number is 2 obligations<br>(SN 3 and 4) |
| 4 | Total Value of Time-Specific and Other Obligations Settled | This value is $207<br>(i.e. $99 + $108) |
| 5 | Total Number of Failed Time-Specific and Other Obligations | 1 obligation was not settled on time<br>(SN 6) |
| 6 | Total Value of Failed Time-Specific and Other Obligations | The value of the obligation not settled on time is $45<br>(SN 6) |

**NOTE:** In case of partial payment of time specific obligations, the partially paid obligation is considered as a failed transaction for the purpose of reporting the metric Total Number of Failed Time-Specific and Other Obligations. The paid up portion is reported as part of the metric Total Value of Time-Specific and Other Obligations Settled. The unpaid portion is reported as part of the metric Total Value of Failed Time-Specific and Other Obligations.

### 14.1.6 Value of Payments Made on Behalf of Correspondent Banking Customers

This metric calculates the total value of payments made on behalf of correspondent banking customers. It applies only to those banks which provide correspondent banking services This metric helps a bank to understand the proportion of a correspondent bank's payment flows that arise from its provision of correspondent banking services. These flows have a significant impact on the correspondent bank's own intraday liquidity management. Internalized payments are also a part of this calculation. Internalized payments refer to the payments made across accounts

OFS LRM application calculates the total value of payments made on behalf of correspondent banking customers on each day. The split up of these total payments- customer-wise is available for the Top 'N' customers, on the basis of total payments made; where 'N' is a user input. The Application also reports the three largest daily total values and the daily average total value of these payments within a reporting period.

This metric is calculated at a Legal Entity- Currency granularity.

### 14.1.7 Intraday Credit Lines Extended to Customers

This metric is applicable for those banks which provide correspondent banking services and extend intraday credit lines to its customers. Intraday credit lines are those in which drawdown and repayment occurs during the same day.

Intraday Credit Lines have two features, Secured and Committed. The secured lines are those which are extended by the correspondent bank to its customer upon placement of any collateral against the same. The committed lines are irrevocable.

OFS LRM application enables to monitor the scale of a correspondent bank's provision of intraday credit to its customers. This metric is calculated at a Legal Entity- Currency granularity.

The following are reported as a part of this metric:

- Total value of credit lines extended
  - Of which total secured
  - Of which total committed
- Total value of credit lines used
  - Of which total secured
  - Of which total committed
- Peak Usage values

  Peak Usage is calculated by the application as follows:

  At the most granular Time bucket level (level 0), the net usage i.e., Total drawdown – Total Repayment is calculated. At the end of the day, the most negative value of this net usage is reported as Peak Usage.

### 14.1.8 Intraday Throughput

This metric calculates the percentage of payments that are settled at each time bucket during the day. It is calculated only in case of banks that are Direct Participants in a payment system.

The application calculates the throughput for both payments made and payments received at every 15 minutes and 30 minutes for throughput reports.

The following are the steps involved in calculating this metric:

1. The application calculates the cumulative cash outflows and inflows at each one hour time band.
2. The cumulative outflows and inflows in each band is divided by the total cash outflow /inflow respectively during the day.

The following is an example for this metric:

A bank has the following intraday transactions that occurred in the payment and settlement system:

| Cash Flow Timing | Payments Received | Payments Made |
|---|---|---|
| 9:00 | 223 | |
| 9:30 | | 19 |
| 10:00 | 95 | |
| 10:15 | | 223 |
| 10:45 | | 99 |
| 11:00 | | 108 |
| 12:00 | 400 | |
| 12:35 | 22 | |
| 14:00 | | 10 |
| 14:05 | 5 | |
| 14:20 | | 45 |
| 15:00 | | 379 |
| 15:30 | 102 | |
| 17:00 | | 11 |

As per the illustration, Intraday throughput is as follows: (this example features that throughput be calculated only for Payments Sent; however the application calculates throughput for both payments sent and payments received).

| Time Bucket | Cash Outflows | Cumulative Cash Outflows (b) | Intraday Throughput (b / a) |
|---|---|---|---|
| 8-9 Hours | 0 | 0 | 0.00% |
| 9-10 Hours | 19 | 19 | 2.13% |
| 10-11 Hours | 430 | 449 | 50.22% |
| 11-12 Hours | 0 | 449 | 50.22% |
| 12-13 Hours | 0 | 449 | 50.22% |
| 13-14 Hours | 10 | 459 | 51.34% |
| 14-15 Hours | 424 | 883 | 98.77% |
| 15-16 Hours | 0 | 883 | 98.77% |
| 16-17 Hours | 11 | 894 | 100.00% |
| Total (a) | 894 | | |

## 14.2 Real Time Monitoring

Real time monitoring of intraday positions helps a bank to track its payments by displaying reports with data fetched directly from the source systems. Intraday sources, payments, net usage at each point in time, time specific obligations and their settlement progress; are few of the key features offered under this section. Real time reports can be refreshed at any time during the day, to view latest positions. Refresh capabilities come in two modes:

- Auto: All reports are refreshed at a pre-set configurable time interval.
- Manual: Each individual report can be refreshed by clicking the refresh button.

The above modes can be utilized at the same time. For example, if you have set an auto interval of 5 minutes, all reports get refreshed at a 5 minute interval. If between auto refreshes, you wish to see latest data on a particular report, the manual refresh button can be used.

The Real Time reports are handled through reporting. For information on Real Time reports, refer OFS Liquidity Risk Management Release V8.0.6.0.0 Analytics User Guide on OHC Documentation Library.

# 15 User Roles and Access

The three basic roles defined in OFS LRM application are as follows:

1. **LRM Analyst**: This user is responsible for defining and maintaining the user interface input parameters and definitions required by the application. This user is also allowed to execute the Runs defined within the application.

   LRM Analyst can define time buckets, business assumptions and Runs with the following access privileges: Add, View, Edit, Copy, Delete, Send for Approval, Make Active, Retire, Approval Summary, as well as execute the Runs created in the application. This user is not allowed to approve definitions. A business assumption or a Run is sent for approval by this user to the LRM approver.

2. **LRM Approver**: This user is responsible for verifying and approving the tasks assigned to and completed by the LRM Analyst. Additionally, this user can execute the Runs created in the application. For instance, this user can approve, and execute a definition.

   LRM Approver can approve business assumptions and Runs defined by the LRM analyst with the following access privileges: View, Approve, Reject, Retire, Approval Summary, and execute the Runs created in the application.

3. **LRM System Administrator**: This user is responsible for ensuring that all inputs required for the liquidity risk calculations have been specified in a functionally appropriate manner, in line with the bank's liquidity risk objectives. LRM Administrator is responsible for preparing the metadata required for LRM, including access to Application Preferences window. This user is allowed to approve all tasks across functional areas of the Liquidity Risk Management application.

   LRM Administrator can perform the following functions: View, Delete, Send For Approval, Approve, Reject, and Approval Summary. This user is not allowed to perform the following functions: Add, Edit, Copy, Make Active, Retire, and execute the Runs created in the application.

**NOTE:**

Refer section Approval Work Flow for more information.

You are allowed to create a user and assign all the above three roles. This user is a Super User.

For information on how to map a user to a user group refer section 'Mapping the User to User Group' in *OFSAA Treasury Risk 8.0.2 Installation Guide*.

# 16 Approval Work Flow

## 16.1 Overview

OFS LRM supports approval workflows based on user roles. A one-step maker-checker approval is supported for business assumption definition and Run definition to ensure that computations are carried out using the right input data.

A definition goes through multiple stages, each with a different status, before it can be used for computation. For instance, when a new business assumption is defined and saved, it will be in 'Draft' status. When the definition is edited and sent for authorization, the status of the definition changes to 'Pending Approval' and so on. Each stage requires action from the relevant user based on the role assigned to her. Similarly, a Run definition goes through the same stages of approval.

## 16.2 Understanding Approval Work Flow

Each definition goes through multiple stages and has a status associated with it in each stage and the following table explains the status at each stage.

| Status | Description |
|---|---|
| Draft | When a new definition is created and saved for the first time it is in 'Draft' status. While in draft status, the user is allowed to make any necessary edits without a change in the version number. |
| Pending Approval | When a definition is sent for approval but is not yet approved by the approver the status changes to 'Pending Approval'. This does not result in a change in the version number. |
| Open | When a definition is rejected by the approver, it changes to 'Open' status and is required to be updated or rectified. This does not result in a change in the version number. After the necessary updates have been made, it goes through the approval process again. You are allowed to delete a version in 'Open' status. |
| Approved | When a definition has been approved by the LRM approver its status changes to 'Approved'. An approved version of the definition, whose 'Active' status is Y, is picked up for execution. This does not result in a change in the version number. |
| In Review | When a definition is edited post approval, but is not yet sent for the next round of approval, the status displayed is 'In Review'. This edit will result in the creation of a new version of that definition with a new version number. This version of the definition is not picked up for execution till it is approved. |

| Status | Description |
|---|---|
| Retired | When a definition is retired, i.e. no longer required for further computations, its status changes to 'Retired'. This action does not result in a change in the version number of the definition.<br>A retired definition no longer appears for selection in the Run Management window while defining new Runs. However, it can still be executed as part of an existing Run definition. A retired definition is not deleted as it was used previously and will be retained for audit purposes. |

The steps which explain the approval work flow process and the tasks that a user can perform during each stage are as follows:

1. To create a new definition, click **Add** icon in the Business Assumptions Summary window. On creation of a new definition it is in 'Draft' status. The icons which are enabled while a definition is in Draft status are as follows: **View**, **Edit**, **Copy**, **Delete**, **Send for Approval**, and **Approval Summary**.

   The actions which are permissible when a definition is in 'Draft' status are as follows:

   - You can view the definition by clicking the **View** icon in the summary window. You cannot edit the values in View mode.
   - You can edit the definition by clicking the **Edit** icon in the summary window and make the required changes. This does not result in a new version.
   - You can copy the definition and save it with a new name by clicking the **Copy** icon in the summary window. The new definition will have the same attributes as the existing definition and will be created as version 0. This definition will be in 'Draft' status and the necessary edits can be made.
   - You are allowed to delete any definition which is in 'Draft' status, by selecting the definition from the summary window and clicking the **Delete** icon.
   - Once the definition is finalized, you can initiate the approval process by opening the definition in edit mode and clicking the **Send for Approval** icon in the definition window. This changes the status of the definition to 'Pending Approval'.
   - You can view the approval workflow for the definition in the Approval Summary window, by clicking the **Approval Summary** icon. This window provides details of each change in the approval status.

2. Once the definition is finalized, it is sent for approval and its status changes to 'Pending Approval'. The icons which are enabled in the 'Pending Approval' status are as follows: **View, Copy**, **Approve**, **Reject**, and **Approval Summary**.

   The actions which are permissible when a definition is in 'Pending Approval' status are as follows:

   - You can view the definition by clicking the **View** icon in the summary window. You cannot edit the values in View mode.

- You can copy the definition and save it with a new name by clicking the **Copy** icon in the summary window. The new definition will have the same attributes as the existing definition and will be created as version 0. This definition will be in 'Draft' status and the necessary edits can be made.
- You can approve the definition, if you have the appropriate access rights, by clicking the **Approve** icon. You are allowed to add comments. The status changes to 'Approved' when you have completed the approval process.
- You can reject the definition, if you have the appropriate access rights, by clicking the **Reject** icon. You are allowed to add comments. Rejecting a definition changes the status to 'In Review'.
- You can view the approval workflow for the definition in the Approval Summary window, by clicking the **Approval Summary** icon. This window provides details of each change in the approval status. This window provides details of each change in the approval status.

**Note**:

- The Approve or Reject buttons are present only for users who are mapped to the LRM Approver role.

3. If a definition is rejected by the LRM approver, its status changes to 'Open'. The icons which are enabled in the Open status are as follows: **View**, **Edit**, **Copy**, **Send for Approval**, and **Approval Summary**.

   The actions which are permissible when a definition is in 'Open' status are as follows:

   - You can view the definition by clicking the **View** icon in the summary window. You cannot edit the values in View mode.
   - You can edit the definition by clicking the **Edit** icon in the summary window and make the required changes. Once the edits are saved, the status still remains in 'Open' status.
   - You can copy the definition and save it with a new name by clicking the **Copy** icon in the summary window. The new definition will have the same attributes as the existing definition and will be created as version 0. This definition will be in 'Draft' status and the necessary edits can be made.
   - After modifying the definition, you can send it again for approval, by clicking **Send for Approval**. This changes the status of the definition to 'Pending Approval'.
   - You can view the approval workflow for the definition in the Approval Summary window, by clicking the **Approval Summary** icon. This window provides details of each change in the approval status.

4. Once the definition is reviewed and approved it status changes to 'Approved'. The icons which are enabled in the Approved status are as follows: **View**, **Edit**, **Copy**, **Make Active**, **Retire**, and **Approval Summary**.

   The actions which are permissible when a definition is in 'Approved' status are as follows:

   - You can view the definition by clicking the **View** icon in the summary window. You cannot edit the values in View mode.

- You can edit the definition by clicking the **Edit** icon in the summary window and make the required changes. The definition is still in 'In Review' status.
- You can copy the definition and save it with a new name by clicking the **Copy** icon in the summary window. The new definition will have the same attributes as the existing definition and will be created as version 0. This definition will be in 'Draft' status and the necessary edits can be made.
- If the definition is an older version that is not currently used for computations, you can make it active to be picked by for executions by clicking the **Make Active** icon in the summary window.
- You can retire a definition when it is no longer applicable or required for calculations, by clicking **Retire** in the summary window.
- You can view the approval workflow for the definition in the Approval Summary window, by clicking the **Approval Summary** icon. This window provides details of each change in the approval status.

5. When an approved definition is edited, a new version of the definition is created with the status 'In Review'. The icons which are enabled in the In Review status are as follows: **View**, **Edit**, **Copy, Send for Approval**, and **Approval Summary**.

   The actions which are permissible when a definition is in 'In Review' status are as follows:

   - You can view the definition by clicking the **View** icon in the summary window. You cannot edit the values in View mode.
   - You can edit the definition by clicking the **Edit** icon in the summary window and make the required changes. The definition is still in 'In Review' status.
   - You can copy the definition and save it with a new name by clicking the **Copy** icon in the summary window. The new definition will have the same attributes as the existing definition and will be created as version 0. This definition will be in 'Draft' status and the necessary edits can be made.
   - You can send a definition for approval by clicking the **Send for Approval** icon in the definition window. This changes the status of the definition to 'Pending Approval'.
   - You can view the approval workflow for the definition in the Approval Summary window, by clicking the **Approval Summary** icon. This window provides details of each change in the approval status.

**Note:**

- Only a business assumption definition, once approved, can be edited. A new version of such the definition is created.
- A Run, once approved, is not allowed to be edited. Hence, no versioning of Runs is supported.

6. You can retire an approved definition, if it is no longer valid, by clicking the **Retire** icon. The icons which are enabled in the 'Retire' status are as follows: **View**, **Delete Copy** and **Approval Summary**.

The actions which are permissible when a definition is 'Retired 'status are as follows:

- You can view the definition by clicking the **View** icon in the summary window. You cannot edit the values in View mode.
- You are allowed to delete the retired definition by clicking the **Delete** icon. A retired business assumption is allowed to be deleted only if it is not used in any Run.
- You can view the approval workflow for the definition in the Approval Summary window, by clicking the **Approval Summary** icon. This window provides details of each change in the approval status.

The table below provides a snapshot of the UI functions that are enabled for each status:

| UI Functions | Status | | | | | |
|---|---|---|---|---|---|---|
| | **Draft** | **Pending Approval** | **Approved** | **Open** | **In Review** | **Retired** |
| Add | □ | □ | □ | □ | □ | □ |
| View | □ | □ | □ | □ | □ | □ |
| Edit | □ | □ | □ | □ | □ | □ |
| Copy | □ | □ | □ | □ | □ | □ |
| Delete | □ | □ | □ | □ | □ | ✓* |
| Send For Approval | □ | □ | □ | □ | □ | □ |
| Approve | □ | □ | □ | □ | □ | □ |
| Reject | □ | □ | □ | □ | □ | □ |
| Make Active | □ | □ | □ | □ | □ | □ |
| Retire | □ | □ | □ | □ | □ | □ |
| Approval Summary | □ | □ | □ | □ | □ | □ |
| Run Execution Parameters | □ | □ | □ | □ | □ | □ |
| Run Execution Summary | □ | □ | □ | □ | □ | □ |

* Deletion is allowed only if the business assumption definition is not used in any Run

The approval work flow and the logical change in each status Is depicted as part of the process flow below:

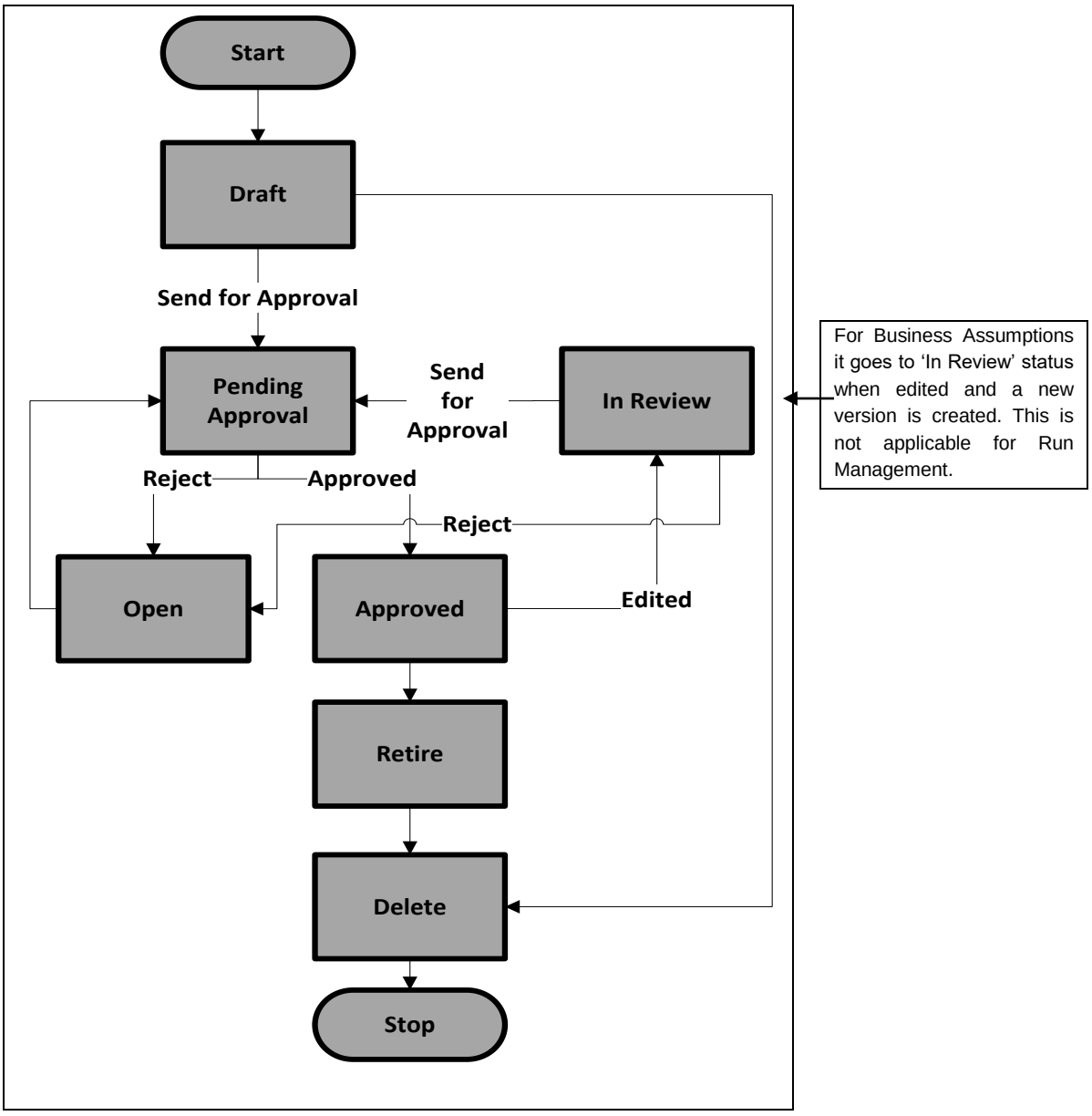



**Figure 56 Approval WorkFlow**

# 17 Annexure A: Functional Details

This section includes the following topics:

# A. LRM Data Flow and Dimensions

This section provides details on the movement of data from staging area or tables to the processing area or tables. The application supports multiple pre-configured table-to-table (T2T) definitions and Data Transformations (DT) for moving data from the staging tables to the processing tables.

This section details the movement of the cash flow data.

1. When OFS ALM is installed:

   The data related to the cash flows generated by the ALM cash flow engine is present in the FSI O Process Cash Flow table. In order to use these cash flows in the LRM system these cash flows are moved to the Fact Process Cash Flow table as part of the ALM – LRM Integration batch execution.

   Data moves from Fact Process Cash Flow table to Fact Account Cash Flow table. The cash flows in Fact Process Cash Flow table are bucketed, that is aggregated at an account- time bucket combination, as they are moved to Fact Account Cash Flow table. This is done as part of the following T2T's:

   - LRM Time Bucket Process Account Cash flow Population
   - LRM Open Maturity Time Bucket Process Account Cash flow Population

   **Note:**

   Cash flows are stored at the granularity of account and time bucket in the Fact Account Cash Flow table whereas they are stored at the granularity of account and cash flow date in the Fact Process Cash Flow table.

2. When OFS ALM is not installed:

   Data on cash flows is expected as an input in the Stage Account Cash Flows table which also contains cash flow dates for all the accounts. The cash flows in Stage Account Cash Flows table are moved to Fact Account Cash Flow table. The cash flows are time bucketed, that is aggregated at an account- time bucket combination, as they move from Stage Account Cash Flows table to Fact Account Cash Flow table. This is done as part of the following T2T's:

   - LRM Fact Account Cash flows Time Bucket Population
   - LRM Fact Account Cash flows Open Maturity Time Bucket Population

3. Cash flows from Fact Account Cash Flow table move into Fact Aggregate Cash Flow table based on user selected aggregation dimensions and the mandatory dimensions. The aggregation dimensions supported by the application are as follows:

| Serial No. | Name | Description |
|---|---|---|
| 1 | Basel Risk Weight | This dimension stores the Basel Risk Weight. |
| 2 | Brokered Deposit Type | This dimension stores the broker deposit type. A broker is an individual or party |

| Serial No. | Name | Description |
|---|---|---|
| | | (brokerage firm) that arranges transactions between a buyer and a seller for a commission when the deal is executed. There are several kinds of brokers, each of whom deals in specific types of transactions. Each broker provides different levels or type of service. List of Values for this table is "Reciprocal", "Sweep" and "Other". |
| 3 | Brokered Transaction Flag | This dimension indicates if there is a broker involved in the account acquisition. Financial institutions may use the services of a broker in acquiring high value accounts. |
| 4 | Business Unit | This dimension stores the data representing a particular Line of Business |
| 5 | Cash Comingling Flag | This dimension stores whether the cash flows are comingled of an SPV with its parent Legal entity or not. SPV is a special purpose vehicle that is structured for structured instruments such as Credit derivatives, Mortgage backed securities and so on. |
| 6 | Collateral Covering Short Position Flag | This dimension stores the asset level that indicates if collateral of the account is used for covering the short position. |
| 7 | Control By Treasury | This dimension indicates if asset is controlled by treasury or not. The stock should be under the control of the function charged with managing the liquidity of the bank (for example, the treasurer), meaning that the function has the continuous authority, and legal and operational capability, to monetize any asset in the stock. Refer Para 33 of Basel III The Liquidity Coverage Ratio and liquidity risk monitoring tools - January 2013 - bcbs238, for more details. |
| 8 | Covering Banks Own Short Position | This dimension stores the indicator, if underlying asset is utilized for covering short positions of bank. If the flag is yes then its covering banks short position. |
| 9 | Credit Line Purpose | This dimension stores the unique identifier for the credit purpose. |
| 10 | Customer Child Flag | This dimension indicates if customer is a legal entity which is a descendent to the legal entity of account in the bank’s organization structure. |
| 11 | Customer Financial Entity Flag | This dimension stores the flag that indicates if customer type is a financial entity or not. |
| 12 | Domestic Customer Indicator | This dimension indicates if customer is a domestic customer. |
| 13 | Downgrade Trigger | This dimension stores whether an account has downgrade trigger associated to it. If 'Y' then yes, else it is no. |
| 14 | Effective Deposit Insurance Scheme Flag | This dimension stores if insurance qualifies as effective insurance as per supervisory criteria. An “effective deposit insurance scheme” refers to a scheme (1) that has the ability to make prompt payouts, (2) for which the coverage is |

| Serial No. | Name | Description |
|---|---|---|
| | | clearly defined and (3) of which public awareness is high. |
| 15 | Effective Residual Maturity Bands | This dimension stores the effective maturity band surrogate key. |
| 16 | Escrow Account Flag | This dimension stores the flag which states if the account is an escrow account or not. An escrow account can be used in the sale of a house. For example, if there are conditions to the sale, such as the passing of an inspection, the buyer and seller may agree to use escrow. In this case, the buyer of the property deposits the payment amount for the house in an escrow account held by a third party. This assures the seller - in the process of allowing the house to be inspected - that the buyer is capable of making payment. Once all of the conditions to the sale are satisfied, the escrow transfers the payment to the seller, and title is transferred to the buyer. |
| 17 | Established Relationship Account Flag | This dimension indicates whether the customer is holding more than one non-transactional account with the bank. |
| 18 | Exposure of One to Four Family | This dimension indicates if the exposure is in the form of one- to four family residential construction loans if the residences have been pre-sold under firm contracts to purchasers who have obtained firm commitments for permanent qualifying mortgages and have made substantial earnest money deposits, and the loans meet the other underwriting characteristics established by the agencies in the general risk-based capital rules. |
| 19 | Facility Type | This dimension stores the purpose of facility line available for liquidity, credit, both or other. |
| 20 | Forward Starting Flag | This dimension stores the flag indicating if the account is going to start in the future date or not. For example this flag will be "Y" for forward starting repos, forward starting options, and so on. |
| 21 | Fully Covered Insurance Flag | This dimension stores the flag which states if account is fully covered under insurance scheme. |
| 22 | Guarantor Us Flag | This dimension stores the flag to identify if the guarantor of the account is "US" or no. This is specifically required for US Federal Reserve classification. |
| 23 | Highly Stable Flag | This dimension stores the high stability indicator of an account. |
| 24 | Home Jurisdiction Flag | This dimension states if liquidity risk is taken in home jurisdiction. |
| 25 | Hqla Collateral Substitution | This dimension stores the flag, whether received collateral for this account is High Quality Liquid Asset (HQLA) and if it can be substituted for non-HQLA assets without the banks consent. |
| 26 | Hqla Collateral Substitution Asset | This dimension stores the asset level, whether received collateral for this account is HQLA, and it can be substituted for non-HQLA assets without the |

| Serial No. | Name | Description |
|---|---|---|
| | Level | banks consent. |
| 27 | Institutional Network Flag | This dimension indicates if the banks are members of institutional networks of cooperative banks. Institutional networks of cooperative banks are legally autonomous banks with specific functions. This is required for application of run-off as specified in BCBS238. |
| 28 | Insurance Coverage Type | This dimension stores the unique surrogate key for insurance scheme coverage type. |
| 29 | Intra Bank Identifier | This dimension stores the intra bank identifier. Indicator is "Y" if customer of an account is within the organization structure of legal entity. |
| 30 | Issuer Us Flag | This dimension stores the flag to identify if issuer of the account is "US" or no. This is specifically required for US Federal Reserve classification. |
| 31 | LRM - Affiliated Brokered Sweep Deposit Flag | This dimension is used to identify if the brokered sweep deposit is deposited in accordance with a contract between the retail customer or counterparty and the bank, a controlled subsidiary of the bank, or a company that is a controlled subsidiary of the same top-tier company of which the bank is a controlled subsidiary. |
| 32 | LRM - Customer Affiliated to Legal Entity Flag | This dimension indicates if customer is an affiliate of legal entity of account. |
| 33 | LRM - Customer Consolidated Subsidiary of Financial Sector Entity Flag | This dimension indicates whether customer is a consolidated subsidiary of a financial sector entity. A consolidated subsidiary means an entity that is owned by the parent company and whose financial statements are included in the consolidated financial state. |
| 34 | LRM - Customer Depository Institution Flag | This dimension stores whether the customer is a depository institution. |
| 35 | LRM - Customer Financial Entity Or Consolidated Subsidiary Of Financial Entity | This dimension stores whether the customer of an account is Financial Entity Or Consolidated Subsidiary of Financial Entity Flag. |
| 36 | LRM - Customer is Sovereign or MDB or US GSE with 20 Percent Risk Weight | This dimension stores whether the customer is Sovereign or MDB or US GSE. |
| 37 | LRM - Deposit Institution Or Consolidated Subsidiary Of Depository Institution | This dimension stores whether the customer of an account is a depository institution, or Consolidated Subsidiary Of Depository Institution Flag. |
| 38 | LRM - HQLA Collateral Substitution | This dimension stores the substitutable collateral asset level surrogate key by |

| Serial No. | Name | Description |
|---|---|---|
| | Asset Level by Entity | the reporting entity. |
| 39 | LRM - HQLA Eligibility Flag | This dimension stores the flag whether the asset is HQLA Eligible or not. |
| 40 | LRM - Issuer Subsidiary Flag | This dimension is used to identify if the issuing entity is consolidated with the covered company or not. |
| 41 | LRM - Mitigant Rehypothecation Maturity Greater than Original Maturity Flag | This dimension indicates, if the underlying (received) rehypothecation maturity greater than asset exchange original maturity date and asset exchange maturity date is within liquidity horizon. |
| 42 | LRM - Non Maturity Account Flag | This dimension indicates whether the account product is non maturing or not. |
| 43 | LRM - Non-Operational Deposit and Non-Brokered Deposit of a Wholesale Customer | This dimension stores the Non-Operational Deposit and Non-Brokered Deposit of a wholesale Customer. |
| 44 | LRM - Sold Exclusively In Retail Market Flag | This dimension stores the flag that indicates if the account is sold exclusively in retail market. |
| 45 | LRM - Third Party Placed Account Flag | This dimension stores non brokered retail Third Party Deposits. |
| 46 | LRM - Underlying Mitigant Hqla Eligibility Flag | This dimension stores whether underlying received collateral is an hqla eligibility flag. |
| 47 | LRM - Underlying Mitigant Segregated Flag | This dimension indicates whether the underlying client pool asset or underlying asset received from counterparty is segregated, that is kept aside from the other assets including the bank's own assets. |
| 48 | Large Customer Flag | This dimension identifies whether the customer is a large customer. |
| 49 | Netting Agreement | This dimension stores indicator to identify if there is netting agreement associated with the record. |
| 50 | Non Performing Asset | This dimension states if account is fully performing. The loan has not defaulted in the past and thereby the bank has no reason to expect a default within the 30-day time horizon. |
| 51 | Operational Deposit Flag | This dimension indicates if the nature of the account is operational. An account where a clearing, custody or cash management relationship exists between the bank and its customer is classified as an operational account. |
| 52 | Option Embedded Flag | This dimension indicates if the security has an embedded option within it. Embedded option refers to a provision in a security that is an inseparable part of the instrument. An embedded option is a special condition attached to a security, and in particular, a bond that gives the holder or the issuer the right to perform a specified action at some point in the future. An embedded option is a part of |

| Serial No. | Name | Description |
|---|---|---|
| | | another security, and as such does not trade by itself. Nevertheless, it can affect the value of the security of which it is a component. A security is not limited to one embedded option, as there may be several embedded options in one security. |
| 53 | Option in or out of the Money Indicator | This dimension stores the identifier to know if option is in the money (I), out the money (O) or at the money (A). These are terms associated with derivative options. |
| 54 | Primary Market Issuer Flag | This dimension indicates if the covered company is the primary market maker for issued securities. |
| 55 | Rehypothycated Flag | This dimension indicates the rehypothecation status of asset. |
| 56 | Residual Maturity | This dimension indicates the residual maturity. |
| 57 | Residual Maturity Less than Liquidity Horizontal Flag | This dimension indicates whether residual maturity period is less than liquidity horizon. |
| 58 | Residual Maturity Time Bucket Skey | This dimension stores the residual maturity time bucket surrogate key. |
| 59 | Revocability Status | This dimension stores the revocable status surrogate key. The values can be, "Conditionally Revocable" or "Unconditionally Revocable". |
| 60 | Secured Status | This dimension identifies the secured or unsecured borrowings Y=secured, N=unsecured. |
| 61 | Segregated Collateral Flag | This dimension indicates if the collateral received is from a pool of assets or posted individually for a specific purpose. |
| 62 | Sell Flag | This dimension is a sell/buy indicator for products such as euro, dollar and fed funds. |
| 63 | Standard Customer Type | This dimension stores the standard customer type. |
| 64 | Structured Flag | This dimension indicates if the issued product is structured. |
| 65 | Trade Finance-Related Obligations | This dimension indicates if trade related obligations are associated with the account. Trade finance instruments consist of trade-related obligations directly underpinned by the movement of goods or the provision of services, such as: (1) documentary trade letters of credit, documentary and clean collection, import bills, and export bills (2) guarantees directly related to trade finance obligations, such as shipping guarantees.<br>Value is "Y" if instrument is having trade related obligations and "N" if such trade obligations are not associated with the instrument. |

| Serial No. | Name | Description |
|---|---|---|
| 66 | Transactional Account Flag | A transactional account is a deposit account held at a bank or other financial institution, for the purpose of securely and quickly providing frequent access to funds on demand, through a variety of different channels. Transactional accounts are meant neither for the purpose of earning interest nor for the purpose of savings, but for convenience of the business or personal client. |
| 67 | Transferability Restriction | This dimension stores the transferability restriction. Sometimes, due to regulatory rules or other market conditions, excess liquidity available in a given legal entity is “trapped”. It is not available for use at the parent entity or the consolidated legal entity. |
| 68 | US HQLA Asset Level | This dimension stores the US asset level. |
| 69 | Underlying Asset Level | This dimension stores the underlying asset's asset level. |
| 70 | Underlying Asset To Cover Bank'S Own Short Position | This dimension stores the flag indicating if account underlying is used for covering the bank short position of different transaction. |
| 71 | Underlying Collateral Received Asset Level | This dimension stores the Collateral Received asset level. |
| 72 | Wholesale Retail Category | This dimension stores the wholesale and retail code. |
| 73 | BIS HQLA Asset Level | This column stores the Asset Level Surrogate key. |
| 74 | LRM - Early Withdrawal Flag | This column indicates whether customer can withdraw before the maturity of the deposit. |
| 75 | LRM - Significant Early Withdrawal Penalty Flag | This column stores the Flag that indicates if the Withdrawal penalty is significant. |
| 76 | LRM - Withdraw Notice Period Greater Than Liquidity Horizon | This column stores the Flag that indicates if Withdrawal Notice period is greater than the Liquidity Horizon (selected by user at run time) |
| 77 | LRM - Self Investment | This column stores the flag that indicates if the account is a self investment account or not. |
| 78 | LRM - Placed at Central Institution or Service Provider | This column identifies whether the deposit is placed by a member of an institutional network of cooperative banks with the central institution, or specialized central service providers that are placed (a) due to statutory minimum deposit requirements, which are registered at regulators, or (b) in the context of common task sharing and legal, statutory or contractual arrangements so<br>long as both, the bank that has received the money and the bank that has deposited participate in the same institutional network’s mutual protection scheme against illiquidity and insolvency of its members. |

| Serial No. | Name | Description |
|---|---|---|
| | | This is as per BCBS238 para 105 to 106. |
| 79 | LRM - Counterparty Risk Weight | This attribute captures the risk weight of the counterparty to, or the customer of a particular transaction with the bank. In case of LCR computation as per BCBS 238, this attribute is used to define appropriate run-off rates to secure funding transactions with counterparties or customers based on their risk weight. |
| 80 | Underlying collateral covering Customer Short Position | This column stores the indicator stating if the underlying asset is utilized for covering short positions of customer. If the flag is yes, then it's covering customer short position. |
| 81 | Underlying collateral covering Bank Short Position | This column stores the indicator stating if underlying asset is utilized for covering short positions of bank. If the flag is yes then its covering banks short position. |
| 82 | Underlying Asset Level Received | This attribute stores the underlying asset category key corresponding to QIS for securities received in swap transaction. |
| 83 | Mitigant Rehypothecation Rights Flag | This attribute indicates whether the bank has re-hypothecation rights on a mitigant. This indicates an asset received as a collateral. 'Yes' indicates rehypothecation rights are present on the mitigant received. |
| 84 | Collateral Substitution Asset Level | This column stores the Asset Level Surrogate key. |
| 85 | Correspondent Banking Flag | This Column indicates whether correspondent banking relationship is present between the bank and the counterparty. |
| 86 | Customer Regulated Financial Entity Indicator | This attribute captures whether the counterparty is a financial entity which is regulated by the regulator in the jurisdiction. A value of 'Y' indicates that the counterparty is regulated financial entity. In the context of BIS BCBS 238, this flag is used to identify whether a customer is subject to prudential regulation or not. |
| 87 | Committed Facility Flag | This flag indicates if the facility is committed or not. In committed facilities, the borrowing companies must meet specific requirements set forth by the lending institution in order to receive the stated funds. If the value is updated as Y indicates that the facility is committed. If the value is updated as N indicates that the facility is not committed. |
| 88 | Downgrade Trigger Activated Flag | This attribute indicates if downgrade trigger for account is active or not. |
| 89 | Cash Flow Type | This column contains the surrogate key for each cash flow type identifier. |
| 90 | LRM - Instrument Position Indicator | This column indicates whether this position is short or long. List of values: S stands for Short Position, and L stands for Long Position |
| 91 | LRM - Covering Position Type | This column stores the source for the delivery into the sale for covering short positions. As per BCBS 238 requirements, the list of values are: |

| Serial No. | Name | Description |
|---|---|---|
| | | CUB - Covered by unsecured borrowing<br>CSB - Covered by secured borrowing<br>COS - Covered by Other Sources<br>UNCOV - Uncovered<br>This column is applicable for short positions. |
| 92 | LRM - Held By Client | This indicates that a client pool asset or asset received from counterparty is segregated i.e. kept aside from the other assets including the bank's own assets. Segregated client pool securities are not freely available to meet all the liquidity needs of the bank and are set aside to be utilized for some specific purpose. Such segregated assets are not considered eligible HQLA as they do not meet the generally applicable criteria for HQLA. Only an HQLA that meets operational and generally applicable criteria is considered eligible to be included in the stock of HQLA. Client pool securities that are not segregated are allowed to be included as part of HQLA.<br>US Final Rule Page 113 |
| 93 | Account Defaulted Flag | This dimension indicates whether the account has defaulted. If the value is updated as Y= the account has defaulted & if the value is updated as N= the account has not defaulted. This is an account that is under prolonged delinquent state. |
| 94 | LRM - BIS - NSFR Cashflow Interval | This dimension refers to the residual maturity band of the cash flows in NSFR calculation. |
| 95 | LRM - Buy Sell Dimension | This dimension indicates if the investment is a Buy or Sell. Buy indicates a Long position in the instrument/security. Sell indicates a Short position in the instrument/security. |
| 96 | LRM - Encumbrance Status Flag | This dimension indicates if an instrument is encumbered, either by pledging, securitization or collateralization. List of values that can be updated are N=Not encumbered, Y-Fully encumbered. |
| 97 | LRM - NSFR Encumbered Band | This dimension refers to the Encumbrance band to which the financial instrument falls in NSFR calculation. |
| 98 | LRM - NSFR Residual Maturity Band | This dimension refers to the residual maturity band to which the financial instrument falls in NSFR calculation. |
| 99 | Margin Type | This dimension indicates the type of margin kept by the counterparty with reporting bank against the default fund. The list of values will include 'IM' for initial margin, 'VM' for variation margin and 'DF' for default fund contribution. |
| 100 | LRM - Major Component Index Flag | This dimension stores if the instrument is part of a major index or not. Indices are composed of securities that are well reputed, the increase and decrease of price |

| Serial No. | Name | Description |
|---|---|---|
| | | of these securities which are weighted decides the movement of the index itself. |
| 101 | LRM - Deposit Primary Purpose | This dimension stores the primary purpose of deposit surrogate key |
| 102 | LRM - Settled Transaction Flag | This dimension stores the indicator stating if the transaction is settled or not. |
| 103 | LRM - Clearing Relationship | This dimension stores if the account is associated with clearing relationship. Clearing denotes all activities, from the time a commitment is made for a transaction until it is settled. Clearing of payments is necessary to turn the promise of payment (for example, in the form of a cheque or electronic payment request) into actual movement of money from one bank to another. Such accounts are considered as operational account. |
| 104 | LRM - Cash Management Relationship | This dimension stores if the account is associated with cash management relationship. Cash management refers to a broad area of finance involving the collection, handling, and usage of cash. Such accounts are considered as operational accounts. |
| 105 | LRM - Custody Relationship | This dimension stores if the account is associated with custody relationship. Custodian is a specialized financial institution responsible for safeguarding a firm's or individual's financial assets and is not necessarily engaged in "traditional" commercial or consumer/retail banking such as mortgage or personal lending. Such accounts are considered as operational account. |
| 106 | LRM - Correspondent Account Type | This dimension stores the type of correspondent account type. The values can be Nostro, Vostro, Cash Advances to other banks. |
| 107 | LRM - Cancelled Deposit Agreed Payout within 30days | This dimension stores whether the deposit has been cancelled and its payout has been agreed to be paid within 30 days to another institution. The list of values are "Y" or "N", where a value of "Y" indicates payment has been agreed to be paid to other institution within 30 days for cancelled deposit. |
| 108 | LRM - Level 1 Underlying Sub Asset Level | This dimension stores the Sub Asset Level Surrogate key of the Underlying posted. |
| 109 | LRM - Level 1 Underlying Sub Asset Level Received | This dimension stores the Sub Asset Level Surrogate key of the Underlying received. |
| 110 | LRM - Meets Group Lower Outflow Criteria Flag | This dimension stores the lower outflow criteria for credit facility and liquidity facility. The list of values are "Y" or "N", where a value of "Y" indicates that the institution meets lower outflow criteria and hence lower runoff rates can be applied for outflows from credit facility and liquidity facility. |
| 111 | LRM - Underlying Standard Product Type | This dimension stores the underlying standard product type surrogate key |

| Serial No. | Name | Description |
|---|---|---|
| 112 | LRM - Meets Group Higher Inflow Criteria Flag | This dimension stores the higher inflow criteria for credit facility and liquidity facility. The list of values are "Y" or "N", where a value of "Y" indicates that the institution meets higher outflow criteria and hence higher runoff rates can be applied for inflows from credit facility and liquidity facility. |

**Table 75 List of Dimensions**

1. As part of the contractual Run execution, data flows from Fact Aggregate Cash Flow table to the reporting tables and the liquidity gap report based on the contractual cash flows is generated from reporting tables. Contractual Run execution assesses the current liquidity status of the organization purely under contractual terms, without the application of any business assumption.

   In a BAU or stress Run execution, the data which was loaded into Fact Aggregate Cash Flow table as part of the underlying contractual Run is re-inserted in the same table against a new execution skey and currency conversion module is re-executed as reporting currency of the contractual Run and the BAU or stress Runs may be different. User-defined BAU or stress business assumptions are executed on the aggregated cash flows in Fact Aggregate Cash Flow table. Once the assumptions are applied, the cash flow in the reporting currency rules for assumptions are adjusted. Currency conversion is re-executed to convert the adjusted cash flows from reporting currency to local and natural currency.
2. Once cash flows are adjusted in the Fact Aggregate Cash Flow table based on the business assumptions applied, data is moved into the reporting tables and Gap reports of Adjusted Cash flow can be generated from these reporting tables.

   Based on the purpose selected in the Run Definition window for the BAU Run,

   - When Liquidity Ratio Calculation is selected, LCR is calculated.
   - When FR2052 a and b is selected, the reporting line reclassification occurs and the reporting measures are aggregated across the reporting lines and moved to the reporting table (Fact Liquidity Reporting table).

## B. Understanding LRM Flow

Liquidity Risk is managed by the LRM application through the following functionalities as represented in the given diagram:

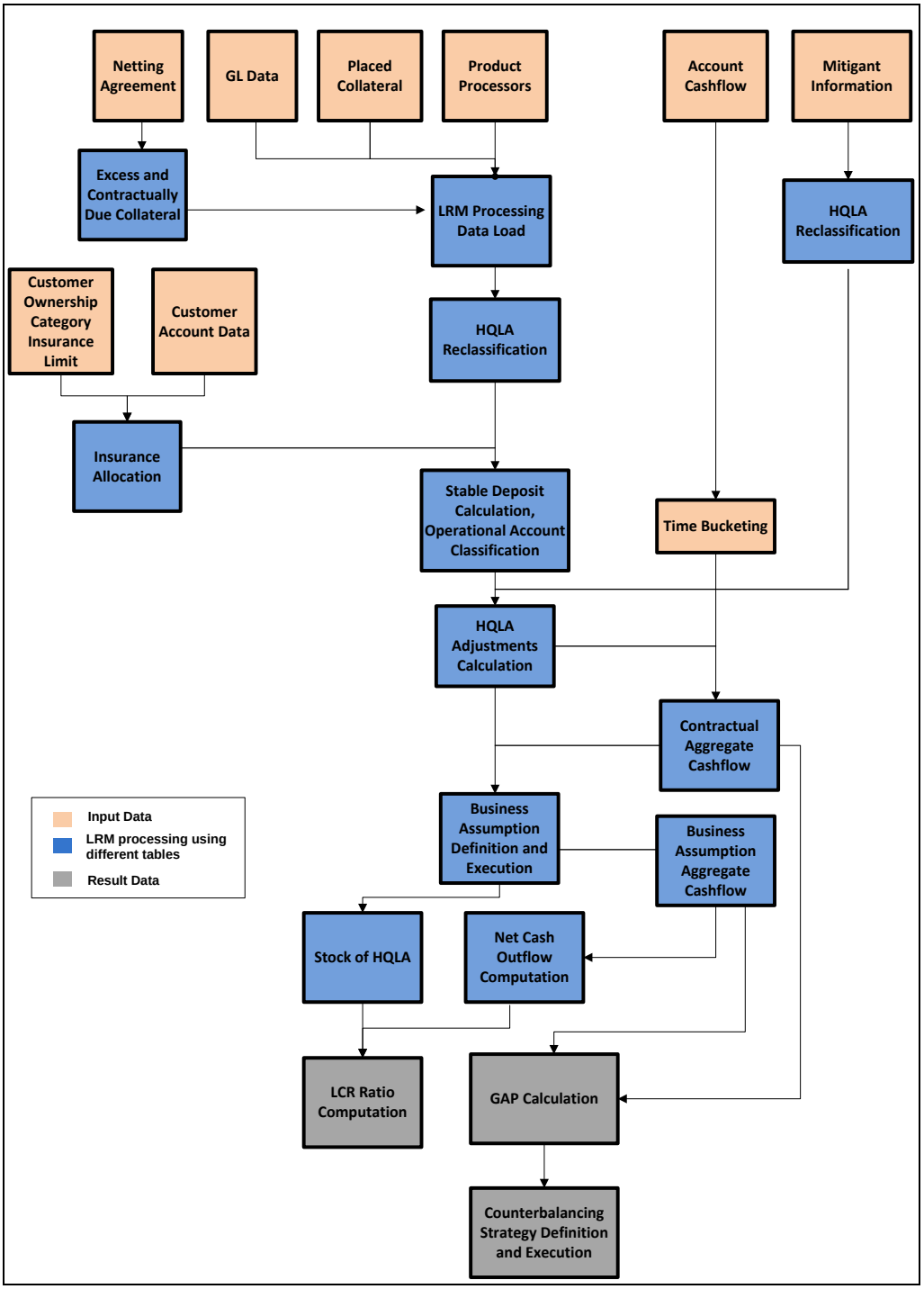



**Figure 57 LRM Flow**

## C. LRM Reports

For detailed information on the LRM reports, refer OFS Liquidity Risk Management Release V8.0.6.0.0 Analytics User Guide on OHC Documentation Library.

# 18 Annexure B: Technical Details

This section includes the following topics:

# A. OFS ALM – OFS LRM Cash Flow Integration

This section is applicable only if a bank has both OFS Asset Liability Management and OFS Liquidity Risk Management installed and if the cash flows generated by OFS ALM are to be considered for calculation within OFS LRM. The following steps are required to be performed to consider the cash flows generated by OFS ALM for LRM computations:

1. Open the **Application Preferences** window, in **Oracle Financial Services Analytical Applications Infrastructure** window. Choose, **Risk Applications** > **Liquidity Risk Management** > **Application Preferences** on the Left-Hand Side (LHS) menu.
2. Select one or multiple cash flow generation processes from the Contractual Cash Flow Process Selection section. This selection enables OFS LRM to use the contractual cash flows generated by OFS ALM for further computations. Refer section Contractual Cash Flow Selection for more information.

   **Note**: For LRM cash flow, every product has a unique scenario that is, for the same product scenarios are not repeated.
3. Refer ALM LRM Integration page in the *OFS Liquidity Risk Management V8.0.6.0.0 Run Chart* for details on the batches to be executed to populate the cash flows from ALM output tables.
4. Once these batches are executed, verify whether the data for the selected process IDs is appearing in the Fact Process Cash Flow table.
5. LRM provides out-of-the-box time bucket definitions which are seeded in DIM_RESULT_BUCKET table. Before defining any ALM time bucket, ensure to increase the sequence SEQ_DIM_RESULT_BUCKET.nextval value to the max+1 value of N_RESULT_BUCKET_SKEY of DIM_RESULT_BUCKET.

## B. Create/Execute LRM Batch from Command Line

To generate the execution IDs the following steps can be followed by passing all requisite parameters at command line. Perform the following steps, to create or execute LRM batch from command line:

1. Navigate to $FIC_APP_HOME/icc/bin path and open lrmExecParams.properties.
2. Provide all the required parameters. All Parameters are mandatory, except for the Contractual Run Execution ID which is required in case of BAU / Stress Run.
   a. **RUNID**:
      - In case of Contractual Run and BAU Run, the N_RUN_OBJECT_ID (FSI_LRM_RUN_PARAM.N_RUN_OBJECT_ID) of the run definition you are trying to execute.

        Example: If the name of the Run definition created is 'TEST2131', execute the below query to get the n_run_object_id

        SELECT T.N_RUN_OBJECT_ID FROM FSI_LRM_RUN_PARAM T WHERE T.V_RUN_NAME LIKE 'TEST2131';
      - In case of Stress Run, the ID of the Stress Run created (ST_STRESS_MASTER.V_STRESS_ID)

   b. **RUNTYPE**: The type code of the Run to be executed is as follows:

      10:- Contractual Run; 11:- BAU Run; 12:- Stress Run

   c. **INFODOM**: Enter the name of the INFODOM which is in use.

   d. **FICMISDATE**: Enter FIC MIS date to be used for execution.

   e. **RUNEXECDESC**: Enter the description for the execution.

   f. **CONTRAEXECID**: In case of BAU/Stress Run, enter the ID of the Contractual Run execution to be used. The following query can be used to find the various Contractual Run Execution IDs:

      **Note:** Choose any value of ITEM_ID column as an input for "CONTRAEXECID" from the result of the query.

```
SELECT DISTINCT R.N_RUN_SKEY,
        R.V_RUN_EXECUTION_ID ITEM_ID,
        R.V_RUN_EXECUTION_ID || '~' || R.N_VERSION_NUMBER ITEM_NAME,
        TO_CHAR(P.FIC_MIS_DATE, 'MM/DD/YYYY') FIC_MIS_DATE,
        BVW.V_BATCH_STATUS STATUS,
        COALESCE(TO_CHAR(P.N_CONTRACTUAL_RUN_EXE_ID), '')
CONTRACTUAL_RUN_EXE_ID,
        P.V_REPORTING_CURRENCY_CODE,
        DECODE(P.V_REPORTING_CURRENCY_CODE,
            C.V_ISO_CURRENCY_CD,
            C.V_CURRENCY_NAME,
            C.V_ISO_CURRENCY_CD) REPORTING_CURRENCY,
        V_EXCHANGE_RATE_SOURCE,
        COALESCE(TO_CHAR(P.N_CONFIDENCE_INTERVAL), '') N_CONFIDENCE_INTERVAL,
        COALESCE(TO_CHAR(P.N_LIQUIDITY_HORIZON), '') N_LIQUIDITY_HORIZON,
        R.D_RECORD_START_DATE EXEC_DATE
 FROM FCT_LRM_RUN_PARAM P, DIM_CURRENCY C, DIM_RUN R, BATCH_RUN_VIEW BVW
 WHERE P.N_RUN_OBJECT_ID = (SELECT P.N_CONTRACTUAL_RUN_CODE
      FROM FSI_LRM_RUN_PARAM P
     WHERE P.N_RUN_OBJECT_ID = <<BAU RUN OBJECT ID>> )
  AND P.N_RUN_SKEY = R.N_RUN_SKEY
  AND P.V_REPORTING_CURRENCY_CODE = C.V_ISO_CURRENCY_CD
  and UPPER(BVW.V_BATCH_ID) LIKE UPPER('%' || R.V_RUN_EXECUTION_ID || '%')
  AND UPPER(BVW.V_BATCH_STATUS) = UPPER('C')
  AND TO_CHAR(R.FIC_MIS_DATE, 'MM/DD/YYYY') =
    TO_CHAR(TO_DATE(<<FIC_MIS_DATE in mm/dd/yyyy format>>, 'MM/DD/YYYY'), 'MM/DD/YYYY')
 ORDER BY EXEC_DATE
```

g. **REPCURRENCY**: Enter the code of the reporting currency to be used. The currency code can be found using the following query:

   SELECT V_ISO_CURRENCY_CD, V_CURRENCY_NAME FROM DIM_CURRENCY ORDER BY UPPER(V_CURRENCY_NAME)

h. **EXCHGRATESRC**: Enter the code of the exchange rate source to be used. The code can be found using the following query:

   SELECT LOOKUP_CD, LOOKUP_DESCRIPTION FROM FSI_LRM_LOOKUP_TL T WHERE T.CATEGORY_ID = 19

i. **LCRHORIZON**: Enter the LCR Horizon (in days) to be used. The default provided is 30.

j. **USER**: Enter the OFSAA application user name.

k. **EXECUTE**: Enter Y/N. Here, Y= Execute Run and N=Create Batch Only.

3. Run the lrmBatch.sh file to create or execute a batch. Provide the input parameter as EXECUTE=Y to execute the batch.
4. Ensure that the wsdl URL is replaced with correct values in LRMWSservices.properties file under $FIC_APP_HOME/icc/lib
   LRM_WSDL_LOCATION=$PROTOCOL$://$WEBSERVERHOST$:$WEBSERVERPORT$/$CONTEXT$/lrmService?wsdl.

## C. Updating Port Changes in OFS LRM

In case you refer the OFS AAI document on how to configure infrastructure ports and execute it, the changes reflect only in the OFS AAI configuration files but not OFS LRM files.

Hence, it is recommended to change the `LRM_WSDL_LOCATION` port number manually in the following location: `$FIC_APP_HOME/icc/lib/LRMWSservices.properties` file with the new servlet port. Note that, this change is required only when the servlet port is changed else it is not required to update the file.

## D. Pre-requisite for RBI LCR Batch Execution

The following are the pre-requisites which must be performed before you begin the RBI LCR batch executions.

The batch users must resave the two given hierarchies and update Setup_Master table as follows:

| SL NO. | Bug ID | Metadata Objects | Metadata Type | Actions |
|---|---|---|---|---|
| 1 | 22312455 | FN_GATHER_STATS_FCT | DT | Update V_COMPONENT_VALUE in SETUP_MASTER to Atomic schema name against V_COMPONENT_CODE -> GATHER_STAT_OWNER |
| 2 | 22587030 | LRMRBIRULE0706 - RBI LCR - HQLA Reclassification - Level 2A - Market Asset-Issuer | Hierarchy | Resave HLRM468 |
| 3 | 22572654 | LCR RetDepRnOff Stble | Business Assumption | Resave HLRM0346 |

## E. Setup Master Table Configuration

The setup master table must be configured for calculating LCR Option 2. The setup master table configuration is as follows:

| Column Name | Component Description | Example Component Value | Comment |
|---|---|---|---|
| LCR_OPT2_MAX_THRESHOLD_EXEMPT_HAIRCUT_PCT | Maximum threshold percent which is exempt from haircut for LCR option 2 | 25 | The maximum threshold haircut percentage which needs to be exempted must be entered and this should be a whole value and not a percentage. |
| LRM4G_HOL_CODE | US 4G Holiday Code | 1 | The holiday code which needs to be used for "US FR2052a Run" and "US FR2052a Run" Runs. |
| LRM_STD_CCY_CD | Standard Currency used in currency conversion | USD | In case reporting currency is not selected then default value provided here is used. |
| OPTION3_HAIRCUT | Additional Haircut required for option 3 LCR | 0.1 | This setup parameter is used for BIS run. This is the haircut percent for option type 3 specified in decimals. (10% will be given as 0.1). |
| DIM_PRODUCT_BALANCE_SHEET_CATEGORY_ASSET | Place Holder for Asset | ASSET | This parameter is to identify the ASSET products in the balance sheet. This should be same as the balance category of assets which is given as download in STG_PRODUCT_MASTER. These values will be used in DTs to identify ASSET products. |
| DIM_PRODUCT_BALANCE_SHEET_CATEGORY_LIABILITY | Place Holder for LIABILITY | LIABILITY | This parameter is to identify the LIABILITY products in the balance sheet. This should be same as the balance category of liabilities which is given as download in STG_PRODUCT_MASTER. These values will be used in DTs to identify LIABILITY products. |
| DIM_PRODUCT_BALANCE_SHEET_CATEGORY_OFF_BAL_SHEET | Place Holder for OFF BALANCE SHEET | OFF BALANCE SHEET | This parameter is to identify the OFF BALANCE SHEET products in the balance sheet. This should be same as the balance category of off-balance sheet items which is given as download in STG_PRODUCT_MASTER. These values will be used in DTs to identify OFF BALANCE SHEET products. |
| DT_ALLOC_HINT_MATERIALIZE | Appends /*+ materialize */ hint in the SELECT statement of the Allocation | N | This is a performance enhancement parameter given as an option to the user. If this parameter is set to 'Y' then the /*+ materialize */ hint will be added to the |

| Column Name | Component Description | Example Component Value | Comment |
|---|---|---|---|
| | Engine Merge Query | | backend query. |
| DT_ALLOC_HINT_USE_HASH | In Allocation Engine Merge Query , whether to use /*+ USE_HASH */ to merge in FCT_AGG_CASH_FLOWS table | Y | This is a performance enhancement parameter given as an option to the user. If this parameter is set to 'Y' then the /*+ USE_HASH */ hint will be added to the backend merge query. |
| DT_FSI_EXCHANGE_RATE_HIST | The entry decides which lookup exchange rates table to be used in Aggregate Cash Flows Population. Y = FSI_EXCHANGE_RATES and N = FCT_FCST_EXCHANGE_RATES | Y | A setup entry which will decide if the spot exchange rates have to be used or forecast exchange rate has to be used. If the parameter is set to 'Y' spot exchange rate will be used (from FSI_EXCHANGE_RATES) else the forecasted exchange rate will be used (from FCT_FCST_EXCHANGE_RATES). |
| DT_PARALLEL_DOP | Degree of parallelism to be used in DML and Queries statements in data transformations | 8 | This is a performance enhancement parameter given as an option to the user. The number specifies the degree of parallelism to be set for the session when the backend query is executing. This parameter will be considered only if DT_PARALLEL_ENABLE parameter is set to 'Y'. |
| DT_PARALLEL_ENABLE | Enables parallel sessions for DML and Queries statements in data transformations | Y | This is a performance enhancement parameter given as an option to the user. If the parameter is set to 'Y' parallel execution will be enabled for the backend query. This parameter along with DT_PARALLEL_DOP will decide the parallelism. |
| LRM4G2A_TIME_BKT_SYS_ID | Time Bucket Definition sys id for US 4G 2a | -1234567 | For 4G 2A reporting the time bucket selected has to be specified here. The time bucket sys id has to be given here. -1234567 is the out of the box time bucket sys id. If the user chooses to customize it with a new time bucket, the corresponding time bucket sys id has to be specified here. |
| LRM4G2B_TIME_BKT_SYS_ID | Time Bucket Definition sys id for US 4G 2b | -1234568 | For 4G 2B reporting the time bucket selected has to be specified here. The time bucket sys id has to be given here. -1234568 is the out of the box time bucket sys id. If the user chooses to customize it with a new time bucket, the corresponding time bucket sys id has to be specified here. |

| Column Name | Component Description | Example Component Value | Comment |
|---|---|---|---|
| LRM_24_MONTH_LOOKBACK_HIST | Contains a boolean value to specify if it is a historical load. 1 specifies historical. Default 0. | 1 | This parameter is used while computing 24 month look back for maximum 30 days net cash flows. If the parameter is set to 1 then 24 months population (historical) will be done. If the parameter is 0 then only the maximum cashflow for last 30 days will be populated to FSI_MTM_COLL_VAL_CHANGE. |
| LRM_PROD_LIST_FOR_ESTABLISHED_REL | This entry specifies the list of products to be considered for established relationship identification. The standard product type code (Level 1 Code) should be given comma separated like LOANS,DEP,ANNUITY | LOANS,DEP | This parameter specifies the list of products to be considered for established relationship identification. The standard product type code (Level 1 Code) should be given comma separated like LOANS,DEP,ANNUITY |
| OPTION3_HAIRCUT | Additional Haircut required for option 3 LCR | 0.1 | This setup parameter is used for BIS run. This is the haircut percent for option type 3 specified in decimals. (10% will be given as 0.1) |
| LRM_CASHFLOW_PROCESS_SCEN_SKEY | Surrogate Key for the Process Scenario (N_PROC_SCEN_SKEY) of table FCT_PROCESS_CASHFLOW | -1 | If user wants to use OFS ALM cash flows for LRM processing then user has to enter the scenario skey of ALM cash flows which needs to be considered for LRM processing. LRM will filter the records based on scenario filter and process on these records. |
| STRUCTURED_OUTFLOW_COMP | Credit Line purpose to be consider for computing Structured Outflow Amount Computation | SPONS | This parameter takes the V_STANDARD_PRODUCT_TYPE_CODE to identify the products which are considered as Credit Line Purpose for computing the Structured Outflow Amount. |
| FR2052A_REPORTERS_DESCRIPTION | This signifies the total consolidated assets and on-balance sheet exposures of the reporting firm. | 1 | The values for this column name must be based on the U.S. firms asset size and 1, 2, 3 signifies the following respectively.<br>U.S. firms with ≥ $700 billion in assets or ≥ $10 trillion in assets under custody; FBOs identified as LISCC firms.<br>U.S. firms with ≥ $250 billion in assets or ≥ $10 billion in foreign exposure; FBOs with ≥ $250 billion in U.S. assets |

| Column Name | Component Description | Example Component Value | Comment |
|---|---|---|---|
| | | | U.S. firms with < $250 billion in assets and < $10 billion in foreign exposure; FBOs with < $250 billion in U.S. assets. |
| FR2052A_REPORTING_SI10 | U.S. firms with less than $700 billion in total consolidated assets and less than $10 trillion in assets under custody and FBOs with less than $250 billion in U.S. assets have the option of not reporting this product. | Y | If user wants to report S.I.10, then this flag must be Y or else N. |
| FR2052A_REPORTING_SI12 | U.S. firms with less than $700 billion in total consolidated assets and less than $10 trillion in assets under custody and FBOs with less than $250 billion in U.S. assets have the option of not reporting this product. | Y | If user wants to report Supplemental S.I.12, then this flag must be Y or else N. |
| FR2052A_REPORTING_SI14 | U.S. firms with less than $700 billion in total consolidated assets and less than $10 trillion in assets under custody and FBOs with less than $250 billion in U.S. assets have the option of not reporting this product | Y | If user wants to report Supplemental S.I.14, then this flag must be Y or else N. |
| FR2052A_REPORTING_SI7_SI8 | If the total amount reported is related to distinct disputes over the previous year for products S.I.7 and S.I.8 is less than $500 million, the reporting firm need not report this product. | Y | If user wants to report Supplemental S.I.7, S.I.8, then this flag must be Y or else N. |

| Column Name | Component Description | Example Component Value | Comment |
|---|---|---|---|
| BIS_REP_CRY | BIS_REP_CRY | EUR | This parameter captures the regulatory limit for the total aggregated funding raised from small business customers who are to be treated similar to the retail customers while identifying deposit stability and applying run-off rates within LCR computations. Any SME customer providing an aggregate funding up to the limit specified as part of this attribute is accorded the same treatment as a retail customer for the purposes of LCR computation. Any SME customer providing an aggregate funding greater than this limit is treated as a wholesale customer. The seeded value for this is 1 million as per BCBS 238. |
| BIS_SMALL_BUIS_LIMIT | BIS Small Business EOP Balance Limit | 1000000 | This parameter captures the currency code in which the regulatory limit for the total aggregated funding raised from small business customers who are to be treated similar to the retail customers, that is, BIS_SMALL_BUIS_LIMIT is captured. The seeded value for this is EUR as per BCBS 238. |
| SIGNIFICANT_CURRENCY_LIABILITY | Currency Significance Percentage | 0.05 | This attribute indicates the definition of a significant currency in terms of the percentage of the aggregate liabilities denominated in that currency over the total liabilities of the bank. A currency is considered “significant” if the aggregate liabilities denominated in that currency amount to 5% or more of the bank's total liabilities. The default value provided for this field is 0.05 (i.e. 5%) as per the regulatory definition. |
| CASHFLOW_NSFR_BANDS | Hierarchy for NSFR Cash Flow Interval | HLRMNS02 | The entry for cash flow interval dimension in to setup master table would consist of the Hierarchy code related to the bands pertaining to NSFR. The hierarchy code HLRMNS02 contains the NSFR cash flow interval bands. |
| BIS_GAAP_CODE | This entry captures the GAAP code to be considered while moving data from STG tables to processing table for BIS jurisdiction. | INGAAP | This entry captures the GAAP code to be considered while moving data from STG tables to processing table for the purpose of regulatory computations as per the BIS jurisdiction.<br>DIM_GAAP is the corresponding dimension table. Although DEFAULT_GAAP entry from ‘setup_master’ table continues to be considered for DIM_ACCOUNT |

| Column Name | Component Description | Example Component Value | Comment |
|---|---|---|---|
| | | | population. |
| LRM_APP_PREF_BASEL_RUN_ID | Basel Regulatory Run Id Selected in Application Preference | -1 | The component value stores the executed basel run skey which is used during the population of Standard Accounting head information for NSFR computation |
| EBA_GAAP_CODE | This entry captures the GAAP code to be considered while moving data from STG tables to processing table for EBA jurisdiction. | UKGAAP | This entry captures the GAAP code to be considered while moving data from STG tables to processing table for the purpose of regulatory computations as per the EBA jurisdiction.<br>DIM_GAAP is the corresponding dimension table. Although DEFAULT_GAAP entry from 'setup_master' table continues to be considered for DIM_ACCOUNT population |
| RBI_GAAP_CODE | This entry captures the GAAP code to be considered while moving data from STG tables to processing table for RBI jurisdiction | INGAAP | This entry captures the GAAP code to be considered while moving data from STG tables to processing table for the purpose of regulatory computations as per the RBI jurisdiction.<br>DIM_GAAP is the corresponding dimension table. Although DEFAULT_GAAP entry from 'setup_master' table continues to be considered for DIM_ACCOUNT population |
| CALC_USED_PORTION_PLCD_COLL_USING_MKT_VALUE | This entry captures the run purposes where used portion of placed collaterals is calculated using market values. Any new run purpose needs to be added with comma | 3,7,16 | This entry captures the list of Run purposes where the used portion of placed collaterals is calculated using market values. The default values for these are the Run Purpose codes corresponding to the Run Purposes Basel III Liquidity Ratios Calculation, and RBI Basel III Liquidity Ratio Calculation EBA Delegated Act Liquidity Ratio Calculation. If this calculation is to be done for any new run purpose, its Run Purpose code needs to be added to this list separated by commas. |
| CALC_SLR_PLCD_COLL | This entry captures the run purposes where the SLR amount from placed collaterals is calculated. Any new run purpose needs to be added with comma | 7 | This entry captures the Run purposes where the SLR eligible placed collaterals are to be identified and the SLR eligible amount is calculated. Currently the default value is 7 which corresponds to the RBI Run Purpose. If any other Run Purpose need this calculation, its Run Purpose Code should be added, separate by comma. |

| Column Name | Component Description | Example Component Value | Comment |
|---|---|---|---|
| HIST_OPERATIONAL_BAL_CALC_UPD | Operational Balance value calculation through the historical balance approach | Y | This entry captures the approach for identifying operational portion of accounts classified as operational deposits. A value of 'Y' indicates that the operational balance is calculated by the application using the historical balance approach where the historical time window to be considered is specified as part of the setup_master parameter 'DAYS_HIST_OPER_BAL_CALC_UPD'. A value of 'N' indicates that such operational balance would be available as a download. |
| DAYS_HIST_OPER_BAL_CALC_UPD | Number of Days considered for calculating Operational Balance value through the historical balance approach | 90 | This entry captures the historical time window to be considered while calculating the operational portion of accounts classified as operational deposits based on the historical balance approach. This value is captured in terms of days. |
| LRM_RBI_SME_AGG_FUNDING_AMT | Funding Limit | 50000000 | This entry captures specifies the aggregate funding threshold for identifying the counterparties as SME's based on limit specified by the regulator. The amount mentioned here is considered in INR. |
| SIGNIFICANT_COUNTERPARTY_LIAB | Significant Counterparty - Percentage of Total Liability | 0.01 | This entry captures the minimum threshold, as a percentage of the total liability amount, for a counterparty to be considered significant. The default value is 0.01 which implies that if the total liabilities from a given counterparty are in excess of 1% of the total liabilities of the legal entity, the counterparty is considered significant. |
| CALC_ESLR_COLL | This entry captures the run purposes where the market value for the ESLR staging types with net CBLO collaterals are calculated. Any new run purpose needs to be added with comma | 7 | This entry captures the run purposes where the market value for the ESLR staging types with net CBLO collaterals are calculated. Any new run purpose needs to be added with comma |
| CALC_USED_PORTION_PLCD_COLL_USING_MKT_VALUE | This entry captures the run purposes where used portion of placed collaterals is calculated using market | 3,7,16 | This entry captures the Run purposes where used portion of placed collaterals is calculated using market values. Any new run purpose needs to be added with comma |

| Column Name | Component Description | Example Component Value | Comment |
|---|---|---|---|
| | values. Any new run purpose needs to be added with comma | | |
| DAYS_HIST_OPER_BAL_CALC_UPD | Number of Days considered for calculating Operational Balance value through the historical balance approach | 90 | Number of Days considered for calculating Operational Balance value through the historical balance approach |
| EBA_AGG_DEPOSIT_THRESHOLD | This attribute captures the deposit threshold for treating the deposits from an SME equivalent to retail deposits as per EBA guidelines. As per EBA Delegated Act, liabilities from an SME would be treated similar to retail deposits where the aggregate deposits by such SME or company on a group basis do not exceed EUR 1 million. | 1000000 | This attribute captures the deposit threshold for treating the deposits from an SME equivalent to retail deposits as per EBA guidelines in terms of Euros. This relates to the threshold for aggregate deposits from a given customer, beyond which an SME would not be treated similar to retail deposits. For instance, if the value is specified as 1000000, any SME whose aggregate deposits do not exceed EUR 1000000 is treated similar to a retail customer. |
| EBA_CUST_EMPLOYEES_LIMIT | This attribute captures the employee threshold for considering a particular party as an SME as per EBA guidelines. The EBA SME definition states that an enterprise must employ fewer than 250 employees to be classified as an small and medium-sized enterprise (SME). | 250 | This attribute captures the employee threshold for considering a particular party as an SME as per EBA guidelines. This relates to the EBA SME definition which provides the employee threshold for an enterprise beyond which an enterprise is not eligible to be classified as an SME. For instance, if the value is provided as 250, then the application will consider only enterprises that employs less than 250 employees as an SME. |
| EBA_HQLA_ISSUE_SIZE_THRESHOLD_1 | This attribute captures the first issue size threshold for classifying a covered bond or debt security as an HQLA in terms of Euros. In case of a non-Euro denominated security, the application will | 500000000 | This attribute captures the first issue size threshold for classifying a covered bond or debt security as an HQLA in terms of Euros. In case of a non-Euro denominated security, the application will convert the issue size to Euros prior to comparing it with this value. |

| Column Name | Component Description | Example Component Value | Comment |
|---|---|---|---|
| | convert the issue size to Euros prior to comparing it with this value. | | |
| EBA_HQLA_ISSUE_SIZE_THRESHOLD_2 | This attribute captures the second issue size threshold for classifying a covered bond or debt security as an HQLA in terms of Euros. In case of a non-Euro denominated security, the application will convert the issue size to Euros prior to comparing it with this value. | 250000000 | This attribute captures the second issue size threshold for classifying a covered bond or debt security as an HQLA in terms of Euros. In case of a non-Euro denominated security, the application will convert the issue size to Euros prior to comparing it with this value. |
| EBA_TOTAL_CUSTOMER_ANNUAL_SALES | This attribute captures the annual turnover threshold for considering a particular party as an SME as per EBA guidelines. The EBA SME definition states that an enterprise should have an annual turnover not exceeding EUR 50 million to be classified as an small and medium-sized enterprise (SME). | 50000000 | This attribute captures the annual turnover threshold for considering a particular party as an SME as per EBA guidelines in terms of Euros. This relates to the EBA SME definition which provides the threshold for the annual turnover beyond which an enterprise is not eligible to be classified as an SME. For instance, if the value is provided as 50000000, then the application will consider only enterprises whose annual turnover is up to this value as an SME. |
| EBA_TOTAL_CUSTOMER_ASSETS | This attribute captures the annual balance sheet threshold for considering a particular party as an SME as per EBA guidelines. The EBA SME definition states that that an enterprise should have an annual balance sheet total not exceeding EUR 43 million to be classified as an small and medium-sized enterprise (SME). | 43000000 | This attribute captures the annual balance sheet threshold for considering a particular party as an SME as per EBA guidelines in terms of Euros. This relates to the EBA SME definition which provides the threshold for the annual balance sheet total beyond which an enterprise is not eligible to be classified as an SME For instance, if the value is provided as 43000000, then the application will consider only enterprises whose annual balance sheet total is up to this value as an SME. |

| Column Name | Component Description | Example Component Value | Comment |
|---|---|---|---|
| FALLCR_PERCENT | SLR Securities Allowable under FALLCR in Percentage | 9 | This attribute captures the SLR eligible securities allowed to be included in the stock of HQLA under the Alternative Liquidity Approach allowed by RBI, the Facility to Avail Liquidity for Liquidity Coverage Ratio (FALLCR), as a percentage of the Net Demand and Term Liabilities (NDTL). |
| HIST_OPERATIONAL_BAL_CALC_UPD | Operational Balance value calculation through the historical balance approach | Y | The attribute identified whether users want to compute the operational portion of the deposits classified as operational as per the regulatory criteria using the historical balance approach or provide it as a download. A value “Y” indicates that the operational balance is to be computed by the application. |
| MSF_PERCENT | SLR Securities Allowable under Marginal Standing Facility in Percentage | 2 | This attribute captures the SLR eligible securities allowed to be included in the stock of HQLA under the Marginal Standing Facility, as a percentage of the Net Demand and Term Liabilities (NDTL). |
| NSFR_ENABLED | This enables NSFR option in Run Management screen for mentioned purposes | 3,7 | This attribute enables the NSFR option in the Run Definition window for the Run Purpose Codes provided. |
| RBICASHFLOW_NSFR_BANDS | Hierarchy for RBI NSFR Cash Flow Interval | HLRMNS08 | This hierarchy is setup parameterized as part of the requirement of the development of the UI screen for configurations of NSFR assumptions. This is because hierarchy is with respect to the cash flows intervals which is normally time bucket definitions for the other assumptions. This hierarchy contains the cash flow maturity bands as per RBI requirement. |
| ADDI_DER_LIA_RSF | This attribute captures the percentage factor for the additional portion of derivative liabilities to be included as part of RSF assumption. | 20 | This attribute captures the percentage factor for the additional portion of derivative liabilities to be included as part of RSF assumption. |

# F. Business Assumption Data Maintenance

## 1. Adding Existing Dimension to the Assumption

The steps to add an existing dimension (which is already part of LRM Data Model) in the assumption are as follows:

### I. Cash Flow Attribute

If it is a Cash Flow Attribute then, perform the following steps:

a. The cash flow attribute must be present in Fact Account Cash flow table and Fact Aggregate Cash flow table with same column name.

b. The cash flow attribute must be part of primary key in Fact Aggregate Cash flow table.

c. Add an entry to the FSI LRM tabular column metadata table. The mandatory columns have to be filled in FSI LRM tabular column metadata table as displayed below:

| Column Name | Example Value |
|---|---|
| V_TABLE_NAME | Should be "FCT_AGG_CASH_FLOWS" |
| V_COLUMN_NAME | Column_Name |
| V_DATA_TYPE | Data type of the column |
| F_CONSTRAINT_TYPE_FLAG | Should be "P". |

### II. Account Attribute

You must add an entry in FSI LRM Business Dimensions table and enter the values which are specified in the description given below:

| Column Name | Column Description | Example Value |
|---|---|---|
| n_business_dimension_number | This attribute stores the Running sequence for list of business dimensions used in LRM application. Business dimensions are set of hierarchies to which liquidity business assumption can be specified. | 56 |
| v_dimm_agg_cashflow_col_name | This attribute stores the physical name of the column in Fact aggregate cash flow table which represents corresponding business dimensions. | F_COLLATERAL_COVER_SHORT_POS |
| v_dimm_acct_summary_col_name | This attribute stores the physical name of column in FSI LRM Instrument summary table which represents corresponding business dimension. | F_COLLATERAL_COVER_SHORT_POS |

| Column Name | Column Description | Example Value |
|---|---|---|
| v_dimension_table_pk_name | This attribute stores the physical name of Primary key column for dimension table of business dimension used in LRM application. | V_FLAG_CODE |
| v_dimension_table_name | This attribute stores the physical name of dimension table for business dimensions used in LRM application. | DIM_BOOLEAN_FLAGS |
| v_dimension_hierarchy_code | This attribute stores the hierarchy code of business dimensions used in LRM application. | HLRM230 |
| v_dimension_alias_table_name | This attribute stores the metadata alias name of dimensions table for business dimensions used in LRM application. Aliases names are created for dimensions like "underlying asset level" on dimensions asset level or for all "flag dimensions" on dimension Boolean flag. If business hierarchy is not created on alias table then this attribute should be empty. | DIM_COLLATERAL_COVER_SHORT_POS |
| v_business_dimension_name | This attribute stores the name of business dimensions used in LRM application. | Collateral Covering Short Position Flag |
| v_business_dimension_desc | This attribute stores the description for business dimensions used in LRM application. | Collateral Covering Short Position Flag |
| v_business_dimension_code | This attribute stores the unique code for business dimensions used in LRM application. | B037 |
| f_selection_flag | This attribute indicates if corresponding business dimension is selected by user for performing analysis in Liquidity Risk Management Application. | Y |
| f_pk_numeric_flag | This attribute indicates if primary key column of the physical table of the dimension table is numeric or not. | N |

### 2. Adding a New Dimension

The steps to add a new dimension (which is not present in LRM Data Model) in the assumptions are as follows:

- New dimensions can be added by including the new dimensions table or creating an alias over the existing dimension table.
- Create a hierarchy on the dimension table or alias.

### I. Cash Flow Attribute

If it is a cash flow attribute then, perform the following steps:

a. Add a column to the following tables:
   - Stage Account Cash flow
   - Fact Process Cash flow
   - Fact Account Cash flow
   - Fact Aggregate Cash flows

b. Ensure that the cash flow attribute in Fact Account Cash flow table and Fact Aggregate Cash flows table has the same name.

c. Ensure to include it part of primary key in Fact Aggregate Cash flow table.

d. Add an entry to the FSI LRM tabular column metadata. The mandatory columns to be filled in FSI LRM tabular column metadata is as displayed below:

| Column Name | Example Value |
|---|---|
| V_TABLE_NAME | Should be "FCT_AGG_CASH_FLOWS" |
| V_COLUMN_NAME | Column_Name |
| V_DATA_TYPE | Data type of the column |
| F_CONSTRAINT_TYPE_FLAG | Should be "P". |

### II. Account Attribute

If it is an account attribute then a column needs to be added to the following tables:

- FSI LRM Instrument
- Fact Aggregate Cash Flow
- FSI LRM Composite Key DIMS
- Fact Business Assumption Audit Trail

This changes the appropriate T2Ts which displays the data from one table to another table.

You must add an entry in FSI LRM Business Dimension and enter the values which are specified in the description given below.

| Column Name | Column Description | Example Value |
|---|---|---|
| n_business_dimension_number | This attribute stores the Running sequence for list of business dimensions used in LRM application. Business dimensions are set of hierarchies to which liquidity business assumption can be specified. | 56 |
| v_dimm_agg_cashflow_col_name | This attribute stores the physical name of the column in Fact aggregate cash flow table which represents corresponding business dimensions. | F_COLLATERAL_COVER_SHORT_POS |
| v_dimm_acct_summary_col_name | This attribute stores the physical name of column in FSI LRM Instrument summary table which represents corresponding business dimension. | F_COLLATERAL_COVER_SHORT_POS |
| v_dimension_table_pk_name | This attribute stores the physical name of Primary key column for dimension table of business dimension used in LRM application. | V_FLAG_CODE |
| v_dimension_table_name | This attribute stores the physical name of dimension table for business dimensions used in LRM application. | DIM_BOOLEAN_FLAGS |
| v_dimension_hierarchy_code | This attribute stores the hierarchy code of business dimensions used in LRM application. | HLRM230 |
| v_dimension_alias_table_name | This attribute stores the metadata alias name of dimensions table for business dimensions used in LRM application. Aliases names are created for dimensions like "underlying asset level" on dimensions asset level or for all "flag dimensions" on dimension Boolean flag. If business hierarchy is not created on alias table then this attribute should be empty. | DIM_COLLATERAL_COVER_SHORT_POS |
| v_business_dimension_name | This attribute stores the name of business dimensions used in LRM application. | Collateral Covering Short Position Flag |

| Column Name | Column Description | Example Value |
|---|---|---|
| v_business_dimension_desc | This attribute stores the description for business dimensions used in LRM application. | Collateral Covering Short Position Flag |
| v_business_dimension_code | This attribute stores the unique code for business dimensions used in LRM application. | B037 |
| f_selection_flag | This attribute indicates if corresponding business dimension is selected by user for performing analysis in Liquidity Risk Management Application. | Y |
| f_pk_numeric_flag | This attribute indicates if primary key column of the physical table of the dimension table is numeric or not. | N |

### 3. Adding tasks to the Assumptions

The steps to add a task to the assumptions registered through LRM Business Assumption window are as follows:

You must add an entry in FSI LRM Assumption tasks table and enter the values which are specified in the description given below.

| Column Name | Column Description | Example Value |
|---|---|---|
| v_task_placement | This attribute stores identifier if task is to be stitched pre-offsetting (offsetting refers to Allocation Engine) or post offsetting (offsetting refers to Allocation Engine) List of values are PRE-OFFSETTING,POST-OFFSETTING. | POST-ASSUMPTION |
| v_task_identifier | This column stores the unique identifier for the task to be included for assumption. | LRMRULE0477 |
| v_assumption_sub_category_name | This attribute stores liquidity business assumption sub-category name. Liquidity business assumption category and sub-category are types of assumptions which are supported and provided out of box in liquidity risk management application. | 72 |
| v_assumption_category_name | This attribute stores liquidity business assumption category name. Liquidity business assumption category and sub-category are types of assumptions which are supported and provided out of box in liquidity risk | 84 |

| Column Name | Column Description | Example Value |
|---|---|---|
| | management application. | |
| n_task_sequence | This attribute stores the sequence in which task is suppose to appear in the Assumption process. | 2 |
| v_task_type | This column stores the type of the task to be included for assumption. Possible values can be DT, Rule. | TYPE3 |
| v_task_name | This column stores the name of the task to be included for assumption. | LRM - Assumption Application Change Balance Update |

# G. Run Management Data Maintenance

### 1. Adding a process for pre/post assumption processing

In LRM Run management, select the purpose for defining a Run from the Run Definition window. Select the required purpose from the drop-down list. It can be either of the following:

- Basel III Liquidity Ratios Calculation
- FR 2052 a Report Generation
- FR 2052 b Report Generation
- Long Term Gap Calculation
- U.S Fed Liquidity Ratio Calculation

Once the purpose is selected and the required parameters are selected a Run is created.

If it is Contractual Run, the Run stitches the processes. The processes are taken from the FSI LRM Process Purpose Map table. This process map table contains all the processes which are required for a Run definition in LRM. When the Run type is Contractual, all the processes with Run type as contractual and process placement as PRE-ASSUMPTION in FSI LRM Process Purpose Map are stitched as part of Contractual Run.

If it is BAU Run, in addition to the processes which come from the process map table, the processes related to the business assumptions selected are automatically stitched into BAU Run.

In case of Contractual Run all the processes in FSI LRM Process Purpose Map must have process placement as PRE-ASSUMPTION only. Whereas in BAU, they are both PRE/POST-ASSUMPTION processes.

If you have to add an entry in FSI LRM Process Purpose Map table, and enter the values which are specified in the description given below.

| Column Name | Column Description of the Entry to be made | Example Value |
|---|---|---|
| v_Run_type | This attribute holds the code for the Run type. The list of values for this column is from FSI_LRM_LOOKUP_TL.LOOKUP_CD with category_id as 1. (filter FSI_LRM_LOOKUP_TL.category_id = 1) | 10 |
| v_Run_purpose | This attribute stores the purpose of the Run. The list of values for this column is from FSI_LRM_LOOKUP_TL.LOOKUP_CD with category_id as 10.( filter FSI_LRM_LOOKUP_TL.category_id = 10). | 2 |
| v_process_placement | This attribute stores identifier if process is to be stitched pre assumption or post assumption List of values are "PRE-ASSUMPTION","POST- | PRE-ASSUMPTION |

| Column Name | Column Description of the Entry to be made | Example Value |
|---|---|---|
| | ASSUMPTION" | |
| n_process_sequence | This attribute stores the sequence in which process is suppose to appear in the Run. | 1 |
| v_Run_type_desc | This attribute holds the description for values Contractual, BAU, Stress | Contractual |
| v_Run_purpose_desc | This attribute stores the description of purpose of the Run. It holds the values are "Long Term Gap Calculation","Basel III Liquidity Ratios Calculation","U.S. Fed Liquidity Ratio Calculation","FR 2052 a Report Generation","FR 2052 b Report Generation" | Long Term Gap Calculation |
| v_rrf_process_object_id | This attribute stores the unique ID of RRF process which will be part of Run for corresponding purpose and Run type. Execution will include this process in the Run. | LRM_PROCESS_001 |
| v_rrf_process_description | This attribute stores the description of RRF process which will be part of Run for corresponding purpose and Run type. Execution will include this process in the Run. | LRM - Party and Product Type Reclassification |
| v_folder_name | This column stores the folder name for which process is defined | LRMSEG |

## H. Executing Intraday Post Load Batch and Intraday Real Time Run

This section details the steps to execute Intraday Post Load Batch and Intraday Real Time Run from Command Line.

### 1. Environment Prerequisites for External Scheduler Utility

The following are the Environment Prerequisites for External Scheduler Utility:

a. JAVA_HOME (Required) points at JAVA bin installation directory.

b. ES_HOME (Required) points to the ES Home folder ($FIC_HOME/utility/ES).

c. Go to ES Utility directory in $FIC_HOME/utility/ES/conf.

d. Update <Infodom>.ini file and specify the values.

- **MISDATE**= Enter the MIS Date in format mm-dd-yyyy (example: MISDATE=01-31-2010)
- **USERNAME**= Log into OFSAAI (example: USERNAME=BASELUSER)

This must be updated daily once for the MISDATE.

**Note**: <infodom> in the name of the file <infodom>.ini must be replaced with the infodom name.

#### I. Intraday – Real Time – Incremental Load Processing

**Prerequisite**

The following are the prerequisites for Intraday – Real Time – Incremental Load Processing:

a. The Load Run ID must be generated and the corresponding entry is present in the table REV_LOAD_RUN_MASTER.

The Load Run ID population occurs in sequence for every successive staging load. The application recognizes the maximum value of Load Run ID as corresponding to the latest data.

b. The stage tables must be loaded with the load Run ID.

c. For Incremental Snapshot Load: For <INFODOM>_INTRADAY_POST_LOAD batch, the parameter passed to Task1 is ‘I’ (By default ‘I’ is present).

The following steps must be followed to execute the Intraday Post Load batch and Intraday –Real Time - Incremental Run:

a. Go to `$FIC_HOME/ficapp/icc/bin`.

b. Execute IntradayIncrementalLoadBatch.sh (The execute permission must be provided if needed).

This triggers the Intraday Post Load batch and Intraday –Real Time - Incremental Run.

To automate the incremental load process during the day, this task is appended as the last task while triggering stage table population.

c. You can view the ES batch logs for individual batch run in the following location:

`$ES_HOME/log/ESIC_<batchrunid>.log`

d. You can view the task level logs in the following location:

`$FIC_HOME /ficdb/log`

`/ftpshare/OFSTRINFO/logs`

e. All the latest records for the MIS_DATE are moved to reporting.

**II. Intraday – Real Time – Complete Snapshot Load Processing**

**Prerequisite**

a. The Load Run ID must be generated and the corresponding entry is present in the table REV_LOAD_RUN_MASTER.

The Load Run ID population occurs in sequence for every successive staging load. The application recognizes the maximum value of Load Run ID as corresponding to the latest data.

b. The stage tables must be loaded with that load Run ID.

c. For Complete Snapshot Load: <INFODOM>_INTRADAY_POST_LOAD batch, it must edited through OFSAAI and the parameter 'S' is passed to Task1. (By default, 'I' is present).

The following steps must be followed to execute the Intraday Post Load batch and Intraday –Real Time - Snapshot Run:

a. Go to `$FIC_HOME/ficapp/icc/bin`.

b. Execute IntradaySnapshotLoadBatch.sh (Give execute permission if needed).

This triggers the Intraday Post Load batch and Intraday –Real Time - Snapshot Run.

To automate the incremental load process during the day, this task is appended as the last task while triggering stage table population.

c. You can view the ES batch logs for individual batch run in the following location:

`$ES_HOME/log/ESIC_<batchrunid>.log`

d. You can view the task level logs in the following location:

`$FIC_HOME /ficdb/log`

`/ftpshare/OFSTRINFO/logs`

e. All the records corresponding to the latest load Run ID registered in the table REV_LOAD_RUN_MASTER for the MIS_DATE is moved to reporting.

# I. Migrating LRM Objects

This section explains LRM specific configurations. The migration process from one set up to another is as follows:

**NOTE:** For Object Migration, refer *OFSAAI 8.0.2.0.0 User Manual* which explains the generic configuration.

1. **Holiday Calendar**:
   a. Excel import/export functionality is available. You must use this functionality for migration.
   b. Refer section Excel Import / Export for information on holiday calendar excel export/import.
2. **Time Bucket**:
   a. Time bucket migration definitions used either in Business Assumption or in Run definition are migrated automatically.
3. **Business Assumption**:
   a. Assumptions can be migrated using OFSAAI "Command Line Utility to Migrate Objects". To understand the migration process, refer section "Command Line Utility to Migrate Objects" of *OFSAAI 7.3.5.0.0 User Manual*.
   b. To export/import LRM Assumption objects, the following object codes and object types must be provided:

      **OBJECT Code= "Assumption Name" ~ "Version of the assumption"**

      **Type="902"**

      For example, to export an assumption:

      **<OBJECTS>**

      **<OBJECT Code="US Unmodified Assumption~1 " Type="902" />**

      **</OBJECTS>**

      **Note**:

      - Once an assumption object is imported, dependent objects like Time bucket definition (if any) are automatically migrated.
      - In case only assumption name is provided without version number, then the latest version of the given assumption will be migrated.
4. **Run Definition**:
   a. Run Definitions can be migrated using OFSAAI "Command Line Utility to Migrate Objects". To understand the migration process, refer section "Command Line Utility to Migrate Objects" of OFSAAI 7.3.5.0.0 User Manual.
   b. To export/import LRM Run objects, the following object codes and object types must be provided.

      **OBJECT Code= "Run Name"**

      **Type="901"**

      For example, to export an assumption:

**<OBJECTS>**

**<OBJECT Code="US Final Run" Type="901" />**

**</OBJECTS>**

**Note**: Once a Run definition is imported, dependent objects like Time bucket definition, assumptions definitions (in case of BAU or Stress Run) are automatically migrated.

## J. Performance Improvement Guidelines

For FSI_LRM_TIME_BUCKET_DAYS table, indexing can be done on the columns N_MIS_DATE_SKEY,N_RUN_SKEY,N_HOLIDAY_CODE and D_BUSS_DAY_CONV_TB_DATE to improve the performance.

As FSI_LRM_TIME_BUCKET_DAYS table is a processing table, clean up can done periodically.

## K. Generating Download Specifications

Data Model for OFS Liquidity Risk Management is available on customer request as an ERwin file.

Download specifications can be extracted from this model. Refer the whitepaper present in OHC Documentation Library for more details.

### 1. Additional Information

- GAAP code is a primary key in staging to support multi-GAAP implementations. In OFS LRM v8.0.2 out of box, the staging product processors to fsi_lrm_instrument T2T's filter for 'USGAAP'.
- Load Run ID is part of the primary key in staging with default set to zero.
- The reserved codes for out-of-box assumptions and runs are as follows:
  - The codes for the seeded assumptions are generated starting from a sequence of 9999995000.
  - The codes for the process/rules/measures/dataset/BP (Metadata) starts from the sequence of 9000.

### 2. HQLA Operational Requirements

To determine if all operational requirements for eligible HQLA as given in the RBI circular are met, it is expected that the bank must provide the same through f_hqla_eligibility_flag as "Y". Apart from this for some operational conditions there are place holders in the staging for example: Controlled by Treasury, operational capabilities to monetize flag and so on have been used in rules to check and update "meets_operational_conditions_for_hqla".

## L. Adding a Custom Run Purpose

To add a new custom run purpose, follow the below steps to add an entry in the Lookup and Process Purpose Map tables:

1. Add an entry in the table FSI_LRM_LOOKUP_TL

   Execute the below SQL query in the atomic schema by replacing the placeholders PURPOSE_ID and PURPOSE_DESCRIPTION.

   ```
   insert into FSI_LRM_LOOKUP_TL (LOOKUP_CD, LANG_CODE,
   CATEGORY_ID, LOOKUP_DESCRIPTION) values ('##PURPOSE_ID##',
   'en_US', '10', '##PURPOSE_DESCRIPTION##')  /
   ```

   Where,

   PURPOSE_ID value is any value greater than 50.

   PURPOSE_DESCRIPTION is a description of the new purpose.

2. Add an entry in table FSI_LRM_PROCESS_PURPOSE_MAP

   Add the task entries for the ##PURPOSE_ID## added in step 1, in the Process Purpose map table for both Contractual and BAU Runs. This gives the pre and post Tasks in the Run.

3. To enable the NSFR option for any of the custom run purposes, enter the respective Run purpose code as comma separated values against the component code ‘NSFR_ENABLED’ in the setup_master table. This code enables the NSFR option in the Run Management screen for the mentioned purposes.

   ```
   select * from setup_master where v_component_code like
   'NSFR_ENABLED'
   ```

## M. Performance Related Configurations for RBI Contractual

Follow the below steps for setting performance related configurations for RBI Contractual:

1. Parameter Settings OracleDB Configuration File

   OFSAAI provides enabling of Parallelism and setting of DOP for every DML sessions invoked by the applications. These parameters are listed in the OracleDB Configuration file (OracleDB.conf) located in the DB layer of the OFSAAI Installation. Navigate to the path `$FIC_HOME/ficdb/conf`, to access the file. Modify the values for the below parameters

   ```
   CNF_PARALLEL_QUERY=ENABLE

   CNF_PARALLEL_DML=ENABLE

   CNF_DEGREE_OF_PARALLELISM=2

   CNF_PARALLEL_DEGREE_POLICY=MANUAL
   ```

**NOTE:** The CNF_DEGREE_OF_PARALLELISM value can be 40% of the available parallel threads per CPU on the database server.

2. Parameter Settings for SETUP_MASTER Table

   a. In the SETUP_MASTER table in the atomic schema, update the below mentioned component codes:

   ```
   PARAMNAME     PARAMVALUE

   DT_PARALLEL_ENABLE Y

   DT_PARALLEL_DOP    2
   ```

**NOTE:** The component value set against the component code DT_PARALLEL_DOP should be same as the CNF_DEGREE_OF_PARALLELISM parameter value set in the OracleDB configuration file as mentioned in step 1 Parameter Settings for OracleDB Configuration File.

   b. Enable the gather stats by setting the component code “GATHER_TABLE_STATS” as “Y” in the setup_master table.

   c. Update the atomic schema name for the component code “GATHER_STAT_OWNER” in the setup_master table.

**NOTE:** You can turn-off the configuration, by disabling the gather stats by setting the component code “GATHER_TABLE_STATS” as “N” in setup_master table.

3. Parameter Settings for Configuration Table

   In the configuration table in config schema, update the below mentioned component code:

```
PARAMNAME  PARAMVALUE

QRY_OPT_USE_ROWID      Y
```

4. Partition the table FLI_LRM_INSTRUMENT based on the n_run_skey.
5. Disable all the foreign key constraints for the table FSI_LRM_INTRUMENT.

## N. Audit Logging

OFS LRM supports audit logging for application specific objects. For details, see section Creating Audit Trail Report, in the OFS AAI User Guide.

For Log4J customizations, see the section Logging, in OFS AAI Administration Guide.

# Glossary

| | |
|---|---|
| **AASF** | Available Amount of Stable Funding |
| **BAU** | Business as Usual |
| **BCBS** | Basel Committee for Banking Supervision |
| **BCBS 188** | Basel III: International framework for liquidity risk measurement, standards and monitoring |
| **HQLA** | High Quality Liquid Asset |
| **ILAS** | Individual Liquidity Adequacy Standards |
| **LCR** | Liquidity Coverage Ratio |
| **Level 1 Assets** | Level 1 Assets as per Basel III Guidelines are as follows:<br>Cash<br>Central bank reserves to the extent that can be drawn down during times of stress.<br>Marketable securities which satisfy the following conditions:<br>▪ Issuer type or Guarantor Type is one of the following:<br>o Sovereign<br>o Central Bank<br>o Non-Central Government Public Sector Entity<br>o Multi-lateral Development Bank<br>o The Bank For International Settlements<br>o The International Monetary Fund<br>o The European Commission<br>▪ They are assigned a 0% risk-weight under the standardized Approach of Basel II<br>▪ Issuer type is not a bank or other financial services entity<br>Debt securities issued in the local currency of the legal entity in which the liquidity risk is being undertaken or the bank's country of domicile where the issuer type is sovereign or central bank and the risk weight assigned to the sovereign is greater than 0%<br>Debt securities issued in foreign currencies, to the extent that matches currency needs of bank's operations in that jurisdiction, where the issuer type is domestic sovereign or central bank and the risk weight assigned to the sovereign is |

| | |
|---|---|
| | greater than 0% |
| **Level 2 Assets** | Level 2 Assets as per Basel III Guidelines are as follows:<br>Marketable securities which satisfy the following conditions:<br>▪ Issuer type or Guarantor Type is one of the following:<br>o Sovereign<br>o Central Bank<br>o Non-Central Government Public Sector Entity<br>o Multi-lateral Development Banks<br>▪ They are assigned a 20% risk-weight under the standardized Approach of Basel II<br>▪ 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<br>Corporate Bonds and Covered Bonds which satisfy the following conditions<br>▪ Issuer type is a non-financial institution<br>▪ Issuer type is not the bank itself for which the computations are being carried out or any of its affiliated entities (in case of covered bonds)<br>▪ Credit rating by a recognized external credit assessment institution is equal to or greater than AA- or if it does not have an external rating, the probability of default as per the internal rating corresponds to a rating which is equal to or greater than AA-<br>▪ 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 |
| **NSFR** | Net Stable Funding Ratio |
| **OFSAAI** | Oracle Financial Services Analytical Applications Infrastructure |
| **RASF** | Required Amount of Stable Funding |
| **Revised Time Buckets** | Revised time bucket is the bucket into which the cash flows are to be moved from the original time bucket. |
| **Unencumbered Assets** | Unencumbered Assets are assets which can easily sold or mortgaged as these assets are free from debt with no legal defects in its title. |

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