Oracle Financial Services Basel Regulatory Compliance for SAMA

User Guide

Release 8.1.1.1.0

August 2021

F33147-01

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Financial Services

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OFS Basel Regulatory Compliance for SAMA

Document Control

Version Number	Revision Date	Change Log
1.0	August 2021	Updated the sections for the enhancements added to in OFS CAP Release 8.1.1.1.0 for SAMA jurisdiction.

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1 Getting Started

1.1 Intended Audience

Welcome to Release 8.1.1.1.0 of the Oracle Financial Services Basel Regulatory Compliance User Guide for SAMA jurisdiction.

This guide is intended for:

- **Technical Analyst**: This user ensures that the data is populated in the relevant tables as per the specifications, executes, schedules, and monitors the execution of Runs as batches.

- **Business Analyst**: This user reviews the functional requirements and information sources, like reports.

- **Data Analyst**: This user is involved with cleaning, validation, and importing of data into the OFSAA Download Specification Format.

- **Administrator**: The Administrator maintains user accounts and roles, archives data, loads data feeds, and so on. The administrator controls the access rights of users.

1.2 Conventions

The following text conventions are used in this document.

Table 1: Document Conventions

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action or terms defined in text or the glossary.
Italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`Monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, file names, text that appears on the screen, or text that you enter.
Hyperlink	Hyperlink type indicates the links to external websites and internal document links.

1.3 Installing this Major Release

For detailed instructions to install this Major Release, see the Oracle Financial Services Capital Adequacy Installation and Configuration Guide Release 8.1.1.1.0.

1.4 Related Information Sources

We strive to keep this and all other related documents updated regularly; visit the [OHC Documentation Library](#) to download the latest version available there. The list of related documents is provided here.

- [OHC Documentation Library](#) **for OFS Capital Adequacy (OFS CAP) Application Pack:**

    - Oracle Financial Services Capital Adequacy Pack Installation Guide

- [OHC Documentation Library](#) **for OFS AAAI Application Pack:**

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

    - *OFS Analytical Applications Infrastructure User Guide*

    - *OFS Analytical Applications Infrastructure Administration Guide*

    - *Oracle Financial Services Analytical Applications Infrastructure Environment Check Utility Guide*

- **Additional documents:**

    - [OFSAA Licensing Information User Manual Release 8.1.1.0.0](#)

    - [OFS Analytical Applications Infrastructure Security Guide](#)

    - [OFS Analytical Applications 8.1.1.0.0 Technology Matrix](#)

    - [Oracle Financial Services Analytical Applications Infrastructure Cloning Guide](#)

2 What's New in this Release

The solution is now compliant with the Basel III compliance for Saudi Arabia in conjunction with the latest guidelines available for the same. The key functionalities addressed in this release are the following:

- Credit Risk
  - Standardized Approach
- Counterparty Credit Risk
  - Standardized Approach
- Operational Risk
  - Basic Indicator Approach
  - Standardized Approach
  - Alternative Standardized Approach
- Capital Structure & Buffers
- Large Exposures Framework
- Leverage Ratio

3   Introduction to Basel Regulatory Capital

In 1988, the Bank for International Settlements published the first guidelines on Capital Adequacy called the Basel I accord which primarily focused on credit risk. Assets of banks were classified and grouped into five categories according to credit risk, carrying risk weights. On 4 July 2006, the BIS Committee issued a comprehensive version of the Basel II Framework. This document also consisted of the changes in the June 2004 Basel II Framework, the elements of the 1988 Accord that were not revised during the Basel II process, and the 1996 Amendment to the Capital Accord to incorporate Market Risks. The major outlines of the Basel II accord are to comply with the three pillars.

- The First Pillar: Minimum Requirements for:

  - Tier 1, Tier 2 and Tier 3 capital

  - Credit Risk

  - Market Risk

  - Operational Risk

- The Second Pillar: Supervisory Review Process and

- The Third Pillar: Market Discipline

The main highlights of Basel III accord of December 2010 (rev June 2011) were:

- Stricter Capital: Basel III requires banks to hold 4.5% of common equity (up from 2% in Basel II) and 6% of Tier I capital (up from 4% in Basel II) of risk-weighted assets (RWA).

- Capital Buffer: Basel III also introduces additional capital buffers, (i) a mandatory capital conservation buffer of 2.5% and (ii) a discretionary countercyclical buffer, which allows national regulators to require up to another 2.5% of capital during periods of high credit growth and (iii) a discretionary G-SIB / D-SIB buffer as applicable.

- Leverage Ratio: Also, Basel III introduces a minimum leverage ratio and two required liquidity ratios. The leverage ratio is calculated by dividing Tier 1 capital by the bank's Total Exposure. Banks are expected to maintain the leverage ratio above 3%.

- CVA Risk: Basel III introduced CVA risk charge in addition to counterparty default risk charge for Over the counter derivative portfolio.

The Oracle Financial Services Basel Regulatory Capital application consists of Capital Adequacy and Risk-Weighted Assets computations as prescribed in Basel I, Basel II, and Basel III Accord.

The Oracle Financial Services (OFS) Basel Regulatory Capital application is categorized into two versions:

- OFS Basel Regulatory Capital Basic supports the Standardized Approach and its variant for the BIS Jurisdiction.

- OFS Basel Regulatory Capital Internal Rating Based Approach: is based on the approaches supported by the OFS Basel Regulatory Capital Basic Application and the advanced approaches for BIS Jurisdiction.

The following approaches are supported in the application:

- Credit Risk
  - Non-Securitization – Standardized Approach & IRB Approach
  - Securitization – Standardized Approach & IRB Approach
- Market Risk
  - Market Risk – Standardized Approach & FRTB Standardized Approach
- Operational Risk
- Operational Risk – Basic Indicator Approach, Standardized Approach, Alternative Standardized Approach Capital Structure & Buffers

3.1 Key Features

The important features of the OFS Basel Regulatory Capital application are as follows:

- One integrated application which allows for different approaches configured for various portfolios.

- Financial institutions can migrate to more advanced approaches as and when required.

- Comprehensive coverage of Credit Risk Mitigation techniques which ensures optimum allocation of Credit Risk Mitigants to exposures for maximum RWA reduction using the optimizer functionality in the application.

- Extensive, pre-built instrument coverage, built to meet Basel III guidelines, which means banks, can get 'up and running' quickly with minimal pre-processing.

- It is a fully transparent application where all Rules and Approaches are visible to business users, reviewers, or auditors.

- Audit Trail is present to maintain accountability of Rules changes, user activity, or system modifications.

4   Overview of OFSAA Infrastructure

Oracle Financial Services Analytical Applications Infrastructure is the complete end-to-end Business Intelligence solution that is easily accessible via your desktop. A single interface lets you tap your company's vast store of operational data to track and respond to business trends. It also facilitates analysis of the processed data. Using OFSAAI you can query and analyze data that is complete, correct, and consistently stored at a single place. It has the prowess to filter data that you are viewing and using for analysis.

It allows you to personalize information access to the users based on their role within the organization. It also provides a complete view of your enterprise along with the following benefits:

- Track enterprise performance across information data store.

- Use one interface to access all enterprise databases.

- Create consistent business dimensions and measures across business applications.

- Automate the creation of coordinated data marts.

- Use your own business language to get fast and accurate answers from all your databases.

- Deploy an open XML and web-based solution against all major relational or multi-dimensional databases on Microsoft Windows and UNIX servers.

This chapter provides an overview of Infrastructure, its components, and explains how these components are organized in the Splash window with the user login process.

4.1   Components of OFSAAI

The OFSAA Infrastructure consists of the following components/modules that are used to deploy an analytical solution.

- Data Model Management

- Data Management Tools

- Unified Analytical Metadata

- Rules Run Framework

- Metadata Browser

- Operations

- Questionnaire

- Process Modelling Framework

- System Configuration & Identity Management

- Object Administration

- Forms Framework

See [OFS Analytical Applications Infrastructure User Guide](#) for more information on all important components/modules of OFSAAI.

5 Application Processing

This section provides details on the application processing components.

5.1 Data Requirements

Data can be divided into the two categories – Setup Tables, and Slow Changing Dimensions (SCD), and can be set up by the bank

- **Setup Tables**

  - A setup table is a set of data that is static and does not change at regular intervals.

- **Dimension Tables**

  - A slowly changing dimension table is a set of data that is static and does not change at regular intervals. For more information on SCD, see the section Slow Changing Dimensions in the Annexure.

5.2 Data Assumptions

This section aims to identify certain data related assumptions for specific tables that help in the smooth functioning of the Basel Regulatory Capital application.

Data Format

- In all the date columns, data is expected as per the **MIS_DATE_FORMAT** of the atomic schema.

- Country and Currency codes are expected as per the ISO standard.

Dimension Table

DIM_CAPITAL_ACCT_HEAD: General Ledger items and Non-General Ledger items are differentiated in the column **F_GL_IDENTIFIER** by the flag Y that indicates the General Ledger items and the flag N that indicates non-General Ledger items.

Mapping Table

FSI_CAPITAL_STANDARD_MAPPING: For certain standard account headline items that are processed by the application, for example, **Net Tier 1 Capital**, **Total eligible Capital**, **Tier 1 Capital Ratio**, and **Capital Ratio**, you are expected to provide mapping for these items as Others in the column **V_CAPITAL_ACCOUNT_IDENTIFIER** in the **FSI_CAPITAL_STANDARD_MAPPING** table. These capital line items mapped as Others are used in the **T2T - CAPITAL_STD_ACCT_HEAD_POP** to insert records into **FCT_STANDARD_ACCT_HEAD** from **FCT_CAPITAL_ACCT_HEAD**.

Across the Basel product, in all the seeded data tables, the open end date is mentioned as 31-DEC-9999. You must not modify this value.

FACT Table

FCT_CAPITAL_ACCT_HEAD: General Ledger items and non-General Ledger items are differentiated in the column **F_GL_IDENTIFIER** with the flag Y that indicates General

Ledger items and the flag N that indicates non-General Ledger items. The T2T that populates data from the table **STG_GL_DATA** to the **FCT_CAPITAL_ACCT_HEAD** table populates the value Y in the column **F_GL_IDENTIFIER.** The T2T that populates data from the **STG_STANDARD_ACCT_HEAD** table to the table **FCT_CAPITAL_ACCT_HEAD** populates the value N in the column **F_GL_IDENTIFIER.** The reclassification of General Ledger and non-General Ledger skeys to standard account head skey (**N_STD_ACCT_HEAD_SKEY**) happens in the **FCT_CAPITAL_ACCT_HEAD** table by either of the following tables:

- A Type 2 rule is used to reclassify by using the **DIM_CAPITAL_ACCT_HEAD** and **DIM_STANDARD_ACCT_HEAD tables.**

- The referencing the mapping table **FSI_CAPITAL_STANDARD_MAPPING**

From the **FCT_CAPITAL_ACCT_HEAD** table, General Ledger and Non-General Ledger data flows into the **FCT_STANDARD_ACCT_HEAD** table. Again, the distinction is based on the flag Y in the column **F_GL_IDENTIFIER**.

5.2.1   Data Loading

The OFSAAI Data Integrator framework allows you to move data flexibly within the Oracle Financial Services Analytical Applications (OFSAA) Data Model at different levels of granularity and various stages of the process.

Data can be loaded into the required Stage or Setup Tables in the following ways:

- **Connecting to other databases**: Relational data sources can be defined to connect to any of the Relational Database Management System (RDBMS) like Oracle, IBM DB2, MS SQL Server, and any RDBMS through native connectivity drivers or ODBC. RDBMS data source lets you define the RDBMS engine present locally or remotely with FTP access to the remote server

- **Flat-Files**: Flat File data source lets you define the flat-file present locally or remotely with FTP access to the remote server. Data files can be made available in the standard staging area configured in OFSAAI. A Flat-File data source is a local data source residing in the staging area of the Infrastructure Database Server.

For more information on the format of the flat file or RDBMS file, see the Download Specifications document.

Further, data can be loaded or maintained by using the following components available in the Data Integrator Framework:

- **Excel upload**: Choose this option when you have moderate quantities of data that are available in an excel file format.

- **Manual Data Entry – Forms**: The Data Entry Forms and Queries (DeFQ) module of the Data Integrator is designed to create user-friendly Data Entry windows with a choice of layouts, which enables data viewing and data manipulation easily. You can select tables based on which you can create forms that can be used in any application.

  For more information on data loading activities like Flat File Source and Connecting to other databases, see the OFS Advanced Analytics Infrastructure User Guide.

5.2.2   Reclassification Rules

A sample list of products, customer types, issuer types, collateral types, credit ratings, and organization structure is pre-defined in the application. However, the list and naming convention of products, customer types, and so on, might differ from one bank to another. The application re-classifies the bank's data into standard data, which does not change for a given set of regulations, and then processes it based on standard classifications. This restricts the level of modifications needed for each implementation for re-classifying the bank's data into the relevant standard classifications.

The list of reclassification rules required for the population is attached in the Annexure.

Setting up the Data

The respective Dimension Tables corresponding to products (**DIM_PRODUCT**), customer types, issuer types (**DIM_PARTY_ TYPE**), collateral type (**DIM_MITIGANT_TYPE**), credit ratings (**RATING_SRC_MASTER** and **DIM_CREDIT_RATING**), and organization structure (**DIM_ORG_STRUCTURE**) are populated with the list of product types, customer types, issuer types, collateral types, ratings, and organization structure as used in the respective bank.

As described in the Data Requirements section, these tables can be populated by directly uploading data into the tables if they are not likely to change frequently or by using the SCD component, if the data is likely to change over some time.

Also, data is expected in **STG_PRODUCT_MASTER**, **STG_PARTY_TYPE_MASTER,** and **STG_MITIGANT_TYPE_MASTER** for the product, party type, and mitigant types. SCDs populate data from these tables into **DIM_PRODUCT, DIM_PARTY_TYPE,** and **DIM_MITIGANT_TYPE**.

Modifying the Re-Classification Rules

You must only populate the SCD tables through the SCD Batches. The hierarchies related to Product Types, Customer Types, and so on, must be re-saved if the data keeps on changing. This can be done individually for each hierarchy using the Unified Metadata Manager or in bulk using the Save Metadata link under Administration on the LHS pane of the OFSAAI window. A new node is created in the source hierarchy. This node is mapped to the node in the target to be added to the target hierarchy. The pre-configured reclassification rules are modified to map the Bank's data to the Standard data using the Rules Framework.

5.3   Processing

After data stores are created and Rules, Processes, and Runs are defined, the timing and frequency of the Execution can be established. For more information on the Runs pre-configured with the application, see the Run Charts. To execute Runs as batches, see the Operations section in the Oracle Financial Services Analytical Applications Infrastructure 8.1 User Guide.

The scheduling of Runs within OFSAAI can be managed on a real-time or batch basis. Batch processes can be executed daily, weekly, monthly, or to meet specific business needs. The Run Management facility also provides the ability to run jobs on a manual or

real-time basis, as required. Existing investments in external schedulers can also be used to call web services within this infrastructure.

5.3.1 Batch Processing

A batch refers to a set of executable processes based on a specified rule. Batches relating to the application must be executed as specified below. These batches are executed from the Operations Menu of OFSAAI. For more information on the Operations section, see the OFSAAI 8.1 User Guide.

Slowly Changing Dimension batch: This must be executed when you are installing the application for the first time. Subsequently, this batch must be executed only when new data is added. The tasks processed and the order in which the tasks are processed, are specified in the Run Charts.

5.3.1.1 Basel Common Batch

The following tasks are mapped to the Basel Common batch:

- Date Population: This task populates the table DIM_DATES.

- Party Role Map Calculation: This task populates the party and the role mapping from STG_PARTY_ROLE_MAPPING to FSI_PARTY_ROLE_MAPPING.

- FSI IRCS Calculation: This task populates FSI_IRCS from STG_IRC_RATE_HIST.

5.3.1.2 PARTY_FIN_DATA_POP Batch

Populates the party financial data and executed as required when the party financial data is available.

5.3.1.3 BASEL_DAILY Batch

This batch is to be executed daily. This batch is used to populate the exchange rate between different currencies for each date.

5.3.1.4 BASEL_SETUP_TBL_POP Batch

This batch is used for Basel set up tables' population. This batch contains T2Ts to populate data from setup tables into the corresponding processing tables. and includes rules to mark the latest data indicators. You are required to provide data in setup tables whichever applicable. The tasks in this batch are adhoc and can be selected as applicable.

For more information on the setup tables for the batches, see the Setup Table Batch Details file.

5.3.2 Basel Configurations

The Basel Configuration framework is a unique feature of the Basel Regulatory Capital application which enables a business user - without assistance from a technical analyst - to easily define a Portfolio and a Run. This framework allows you to define a Run by

selecting a combination of different Basel approaches for RWA computation. It also allows you to define a Run for a combination of portfolios.

The application Runs can be executed as RRF batch from the **Run Management** UI. The Run Management UI lists all Runs defined in Rule Run Framework. For more information on the Rule Run Framework, see the Rule Run Framework in the [Oracle Financial Services Analytical Applications Infrastructure 8.1 User Guide](#).

For CBRC Jurisdiction, if Credit Risk is selected in Run Management, then the relevant questions are not displayed as Credit Risk is not a part of CBRC jurisdiction in Basel Regulatory Capital Basic and no approaches/options are mapped to the segment.

The Basel Configurations feature consists of the following 3 functionalities:

- Optimizer

- Portfolio Definition

- Run Management

5.3.2.1 Optimizer

A prerequisite for defining the Optimizer is to update the pool ID in the sub-exposures **FCT_SUB_EXPOSURES** table for the selected Run.

5.3.2.1.1 Viewing an Optimizer

To view the optimizer, perform these steps:

1. Log in to the application and select **Financial Services Basel Regulatory Capital Basic**.

2. On the LHS menu, click **Basel Regulatory Capital Basic**, click **Basel Configurations**, and then click **Optimizer** to open the **Optimizer Models** window.

   Figure 1: The Optimizer Models window

3. Select an optimizer to view it.

5.3.2.1.2 Executing an Optimizer

Prerequisites:

You must ensure the following before executing the optimizer:

1. Complete the pooling process and update the **N_POOL_ID** column in the **FCT_SUB_EXPOSURES** table.

2. Optimizer models are defined and accessible on the **Optimizer Models** page. These models are mandatory in order to execute the model for a particular exposure type.

Executing an Optimizer through an Independent Process

Follow these steps to execute an optimizer as an independent process:
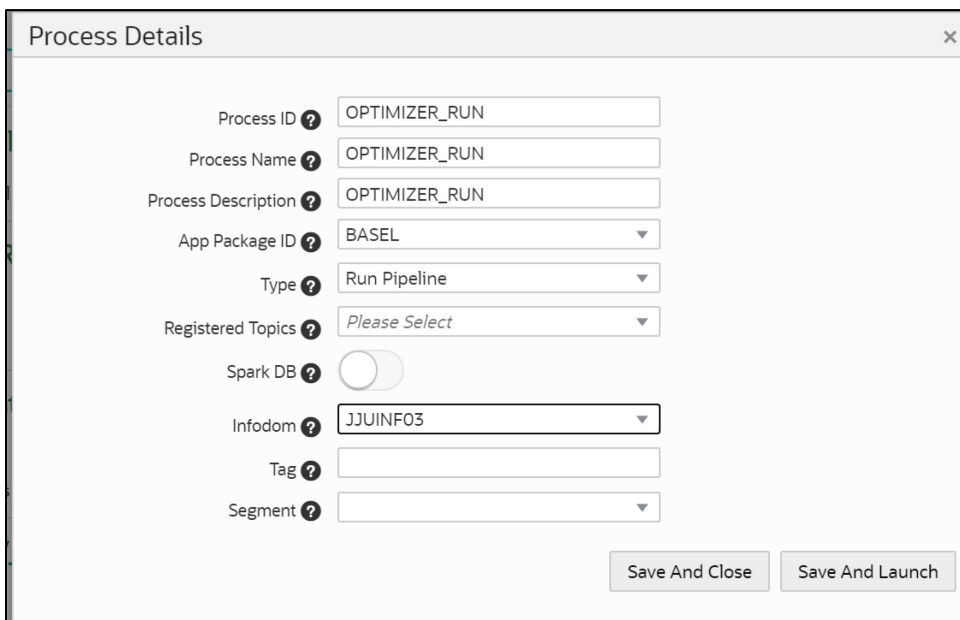
1. Log in to the application as a System Administrator.

2. Click **Basel Regulatory Capital Internal Ratings Based Approach** or **Basel Regulatory Capital Basic** depending on the application that you have the license for.

3. Click **Process Modelling** and then click **Process Modeller**.

4. Click **Add** to open the **Process Details** window.

Figure 2: The Process Details window

5. Populate the fields in the **Process Details** form as tabulated.

Table 2: The Process Details form

Fields	Description
Process ID	Enter an ID for the optimizer process.
Process Name	Enter a name for the optimizer process.
Process Description	Enter a description for the optimizer process.
App Package ID	Select an application package ID from the drop-down list.
Type	Select the type from the drop-down list.
Spark DB	Do not enable this field if you want to keep the default settings.
Infodom	Select the infodom from the drop-down list.
Tag	Enter the names of the tags to be used for the optimizer process.
Segment	Select a segment from the drop-down list.

6.   Click **Save and Launch** to open the **Process Definition** window.

7.   Click **Start** and drag the **Start** process in to the canvas.

Figure 3: The Start Process has been added to the Canvas
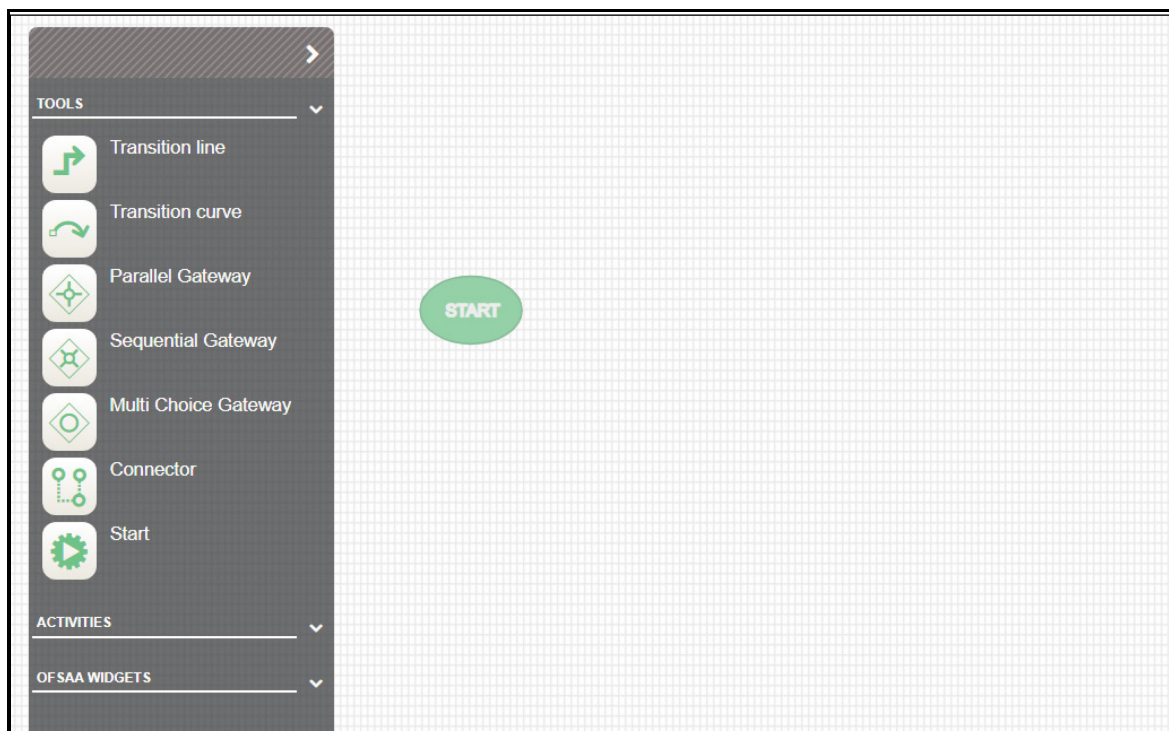
8.   Click **ACTIVITIES** to expand it.

9.   Click and drag **Service Task** process component into the canvas.

Figure 4: The Service Task Process Added to the Canvas
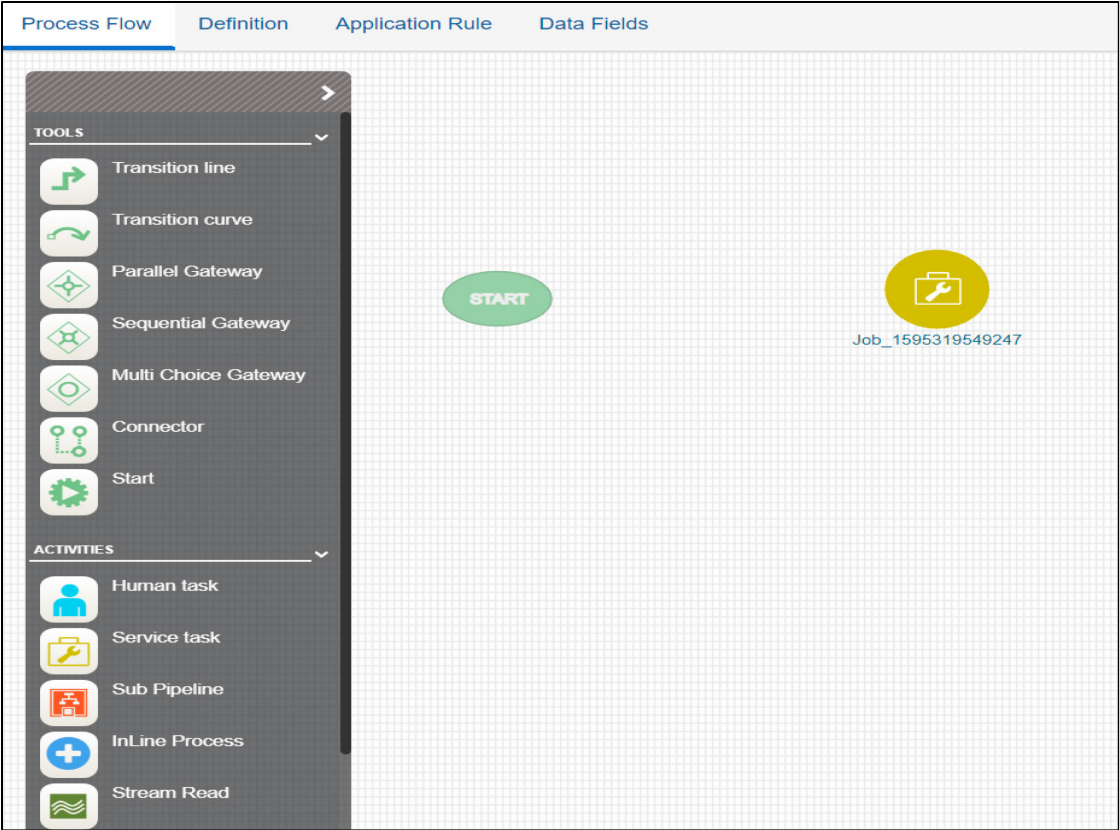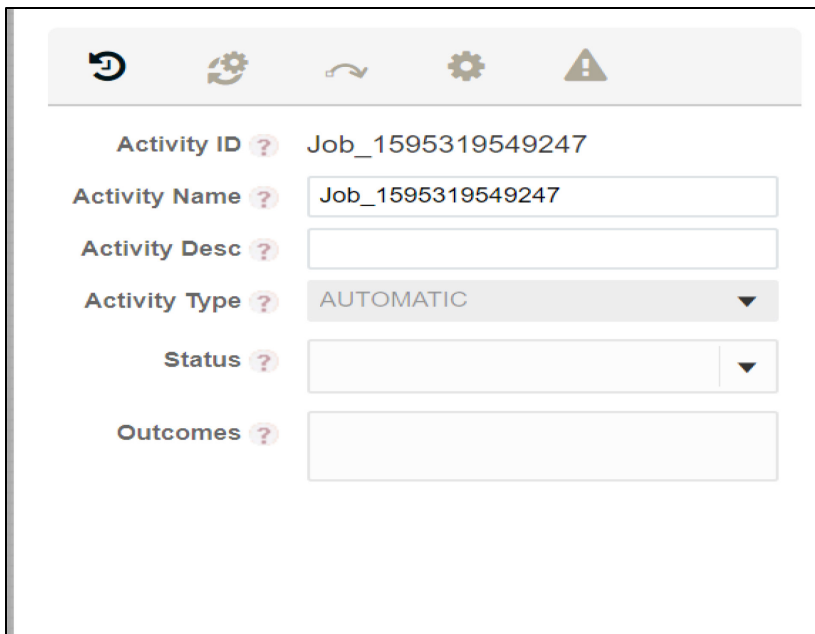
10. Join the **Start** component to the service task component by dragging the **Transition line** connector in to the canvas.

Figure 5: The Transition Line connector Added to the Canvas
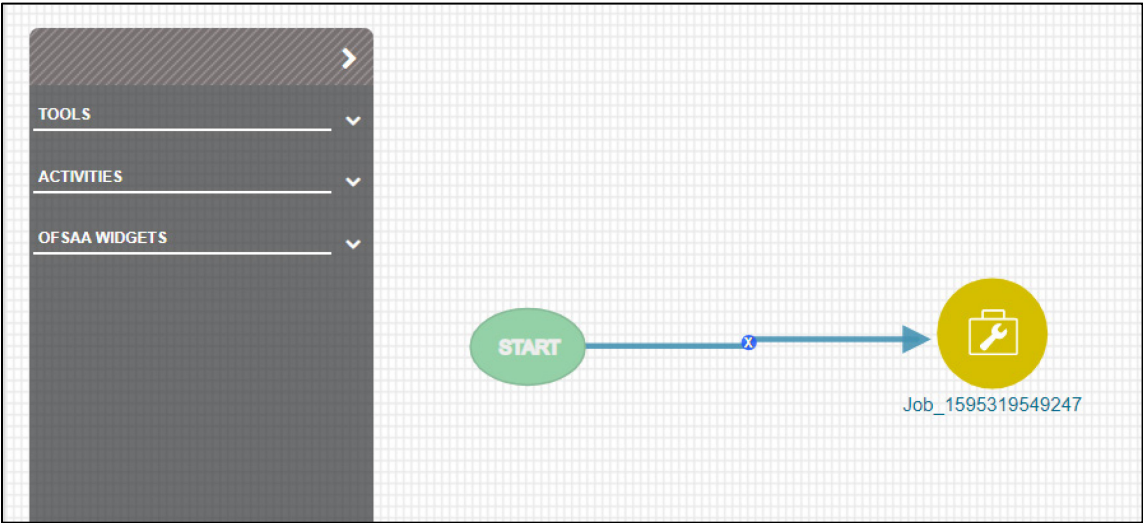
11. Double-click the service task component to open the **Settings** window.

Figure 6: The Settings Window
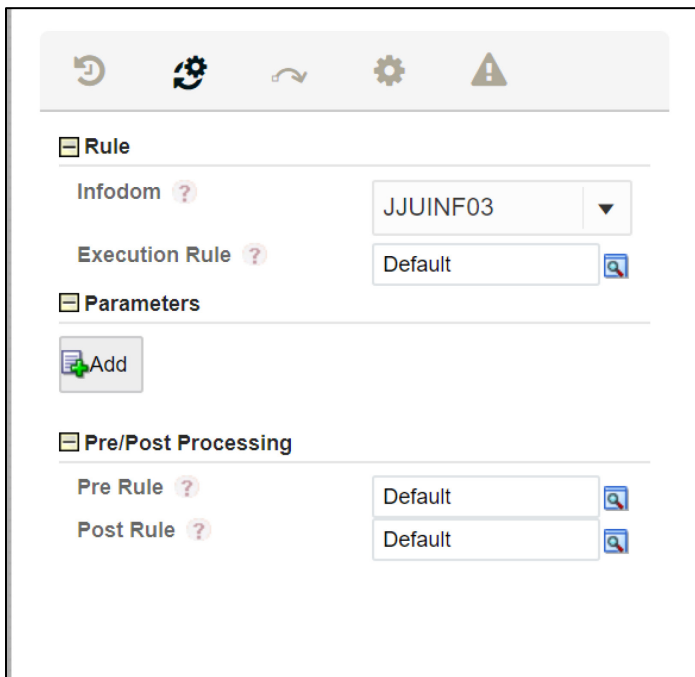
12. Click **Settings** [icon] to open the **Settings** tab.

Figure 7: The Settings Tab

13. Click **Find** [icon] to open the **Participant Details** screen.

Figure 8: The Participant Details Window

—

14. Click the rule **Basel Optimizer Solver for Covered Factor Estimation** and then click **OK**.

15. Click **Add** to open the **Binding Details** window. The Data Field is automatically populated with the input value BASEL_OPTIMIZER_MODEL_CODE.

Figure 9: The Binding Details

16. Click **Ok**.

In case the model code is not available on the screen, you can retrieve it from the **FSI_BASEL_OPTIMIZER_MODEL_TL** table.

Figure 10: Sample Model Code Retrieval Query

Select * from FSI_BASEL_OPTIMIZER_MODEL_TL where V_MODEL_DESC = 'Basel III Non Sec Optimization';

The **Parameters** pane is populated with the values that you added in the **Binding Details** window.

Figure 11: The Parameters pane Populated with Values

17. Click **Save**.

The newly created optimizer run appears on the **Process Modeler** page.

Figure 12: The Newly Created Optimizer Run appears on the Process Modeler Page

18. Click **More** to view additional actions.

Figure 13: The Available Actions for a Run
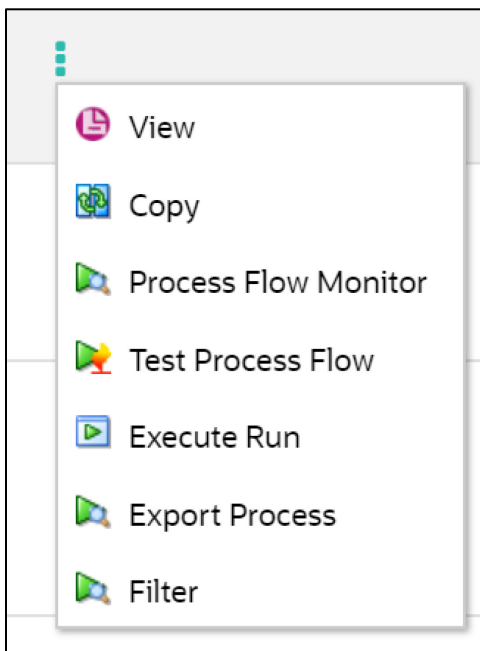
19. Click **Execute Run** to open the **Select Run Params** window.

Figure 14: The Select Run Params Window

20. Populate the **Select Run Params** form as tabulated.

Table 3: The Select Run Params pane

Field	Description
Execution Date	Select the Execution Date by clicking **Calendar** 🗓 .
Legal Entity	Select a legal entity.
Consolidation type	Select the consolidation type from the drop-down list.
Reporting Currency	Select the reporting currency.
Significant Currency	Select the Significant Currency from the drop-down list.
Basel Configuration	Select the Basel Configuration from the drop-down list.

21. Click **OK** to go back to the **Process Modeler** page.

The optimizer run is in progress.

22. Click **More** ⋮ and then select **Process Flow Monitor**.

The run status will be either Running or Completed.

Figure 15: The Status of the Run
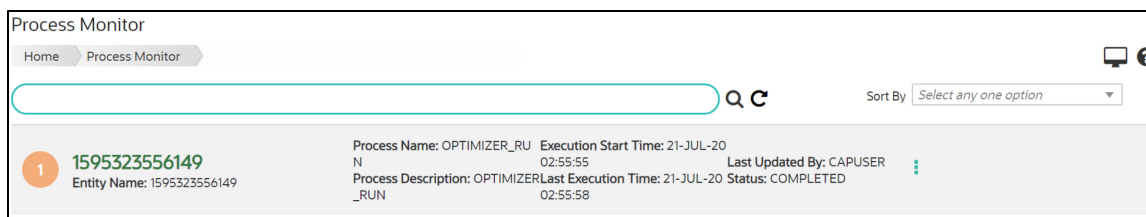
Executing an Optimizer via the Sub-process of a Different Run

The steps to execute an optimizer run via the sub-process of a different run is similar to the steps in the Executing an Optimizer through an Independent Process section. The only difference is that the optimizer run that you want to execute is connected to a different run in the canvas of the Process Details screen.

5.3.2.1.3   View the optimizer log

View the Optimizer Log on via the Process Monitor Page

Follow these steps to view the log from the Process Monitor screen:

1. On the **Process Monitor** pane, click the required optimizer for which you want to view the log to open the **Process Definition** window.

2. Double-click the service task process in the canvas to open the setting window.

   Figure 16: The Setting Window

3. Click **Log** [icon] to view the log of the optimizer run.

View the Optimizer Log on the Database Table

You can view the log by referring to the CL_LOG_MESSAGE column in the **FSI_BASEL_OPT_SOLVER_BATCH_MASTER** table.

View the Optimizer Log on the Server

The optimizer BaselSolver.log file is available in the server machine in the path:
`<web_container_location>/webapps/OFSCAP/logs`

5.3.2.2 Portfolio

You can define a combination of portfolios to participate in a Run. For example: If an institution wants to process only On Balance Sheet data and not all the product types, then the institution has the choice of selecting a subtype of an entire portfolio for processing.

5.3.2.2.1 Adding a New Hierarchy for Portfolio Creation

To add a new hierarchy for portfolio creation, the hierarchy code must be added in **PORTFOLIO_HIERARCHY_MASTER** table as tabulated:

Table 4: The PORTFOLIO_HIERARCHY_MASTER table

Column	Indicative values
V_HIERARCHY_CODE	Contains hierarchy code of the hierarchy to be added
F_LATEST_RECORD_INDICATOR	To be set to 'Y' for the hierarchies which have to be displayed
D_RECORD_START_DATE	Start date of the hierarchy.
D_RECORD_START_DATE	The end date of the hierarchy.

5.3.2.2.2 Access Portfolio Definition

To access a portfolio definition, follow these steps:

1. Log in to the application and select **Financial Services Basel Regulatory Capital Basic**.

2. On the LHS menu, click **Basel Regulatory Capital Basic**, click **Basel Configurations**, and then click **Portfolio** to open the **Portfolio Definition** window.

Figure 17: The Portfolio Definition Window
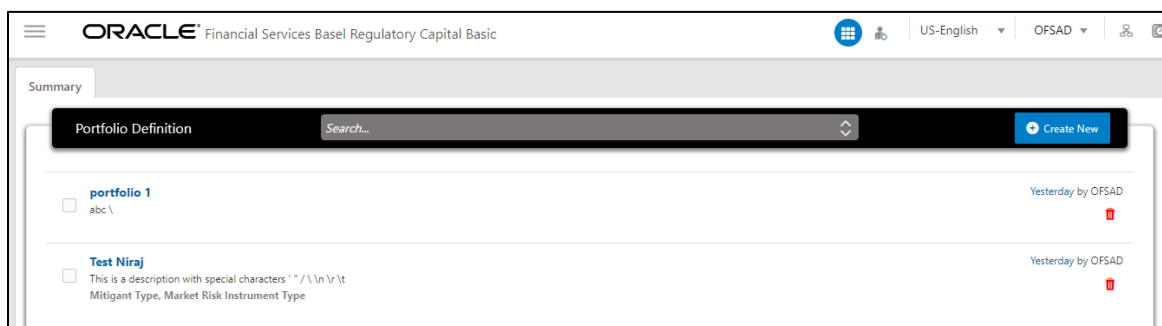
5.3.2.2.3 Create a Portfolio Definition

To create a portfolio definition, follow these steps:
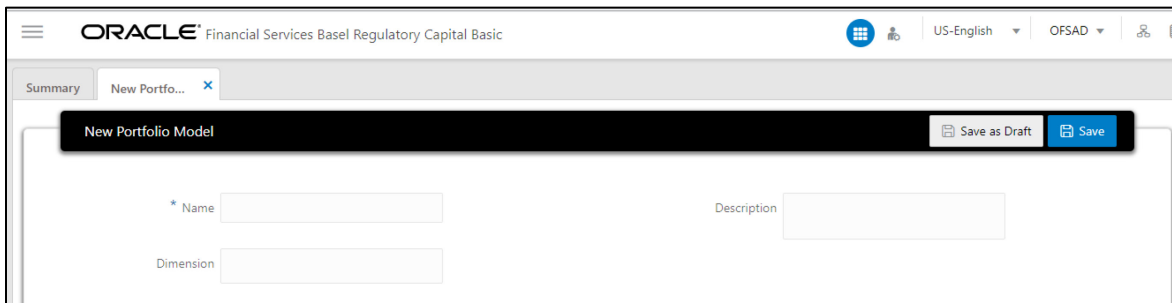
3. In the **Portfolio Definition** window, click **Create New** to open the **New Portfolio Model** window.

Figure 18: The New Portfolio Model Window

4. Populate the details as per the following table:

Table 5: The New Portfolio Model pane

Field	Description
Name	Enter a name for the portfolio definition.
Dimension	Select a dimension(s) from the drop-down list. Available options are: • Counterparty Type • Market Risk Counter Party • Mitigant Type • Product • Market Risk Instrument Type
Description	Enter a description of the portfolio definition.
Add Dimension	This pane only appears after you select a dimension(s) in the Dimension field. Click **Add** ➕ to open the window for the selected dimension and select the required options.

5. Click **Save as Draft** if you want to save a draft of the portfolio.

6. Click **Save**.

5.3.2.2.4 Delete a Portfolio

To delete a portfolio, follow these steps:

1. In the **Portfolio Definition** window, for the portfolio that you want to delete, click **Delete** 🗑.

2. A confirmation message appears, asking you if you are sure that you want to delete the portfolio.

3. Click **Yes**.

The portfolio is deleted, and the **Portfolio** page is refreshed to display the updated list of portfolios.

5.3.2.3 Run Management

The Run feature in the Rules Run Framework helps you to combine various components and/or processes together and execute them with different underlying approaches. For more information on the Run Management feature, see the **Run** section in the [Oracle Financial Services Analytical Applications Infrastructure 8.1 User Guide](#).

5.3.2.3.1 Access the Run Management Page

To access the **Run Management** Window:

1. Log in to the application and select **Financial Services Basel Regulatory Capital Basic**.

2. On the LHS menu, click **Basel Regulatory Capital Basic**, click **Basel Configurations**, and then click **Run Management** to open the **Run Management** window.
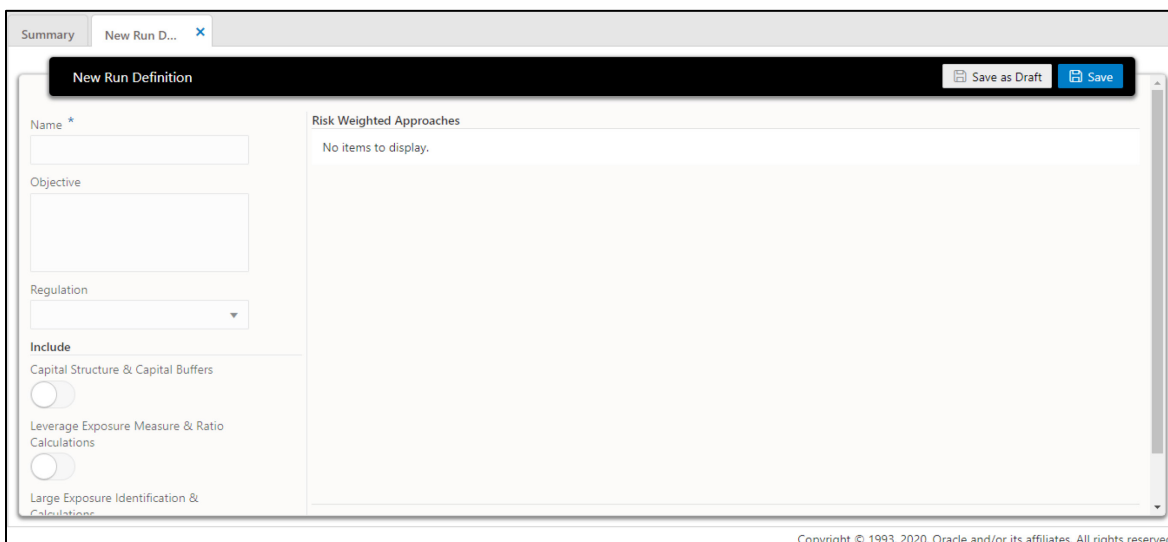
5.3.2.3.2 Create a Run Definition

Follow these steps to create a run definition:

To create a run definition, follow these steps:
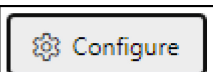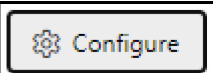
1. In the **Run Management** window, Click **Create New** [+ Create New] to open the **New Run Definition** window.

   Figure 19: The New Run Definition window

2. Populate the details as tabulated.

   Table 6: The New Run Definition form

Field	Description
Name	Enter a name for the run definition.
Objective	Select an objective for the run definition.
Regulation	Select a regulation from the drop-down list. The available options are: • BASEL III • BASEL IV Depending on the value that you select in this field, the Risk-weighted Approaches pane is automatically updated.
Include pane	
Capital Structure & Capital Buffers	Click the [toggle] icon to enable this field.
Leverage Exposure Measure & Ratio Calculations	Click the [toggle] icon to enable this field
Large Exposure Identification & Calculations	Click the [toggle] icon to enable this field
Risk-weighted Approaches pane	
	NOTE: The risk-weighted approaches that appear in this field depend on if you have the license for the Oracle Financial Services Basel Regulatory Capital Basic or Oracle Financial Services Basel Regulatory Capital IRB application pack and if you selected either BASEL III or BASEL IV in the Regulation field.
Credit Risk and Counterparty Credit Risk for Non Securitization Exposures – Standardized Approach	Click **Configure** [⚙ Configure] to open the configurations window for this risk-weighted approach. See step 7 to view and populate the fields available in this window.
Credit Risk and Counterparty Credit Risk for Non Securitization Exposures – Foundation IRB Approach	Click **Configure** [⚙ Configure] to open the configurations window for this risk-weighted approach. See step 7 to view and populate the fields available in this window.
Credit Risk and Counterparty Credit Risk for Non Securitization Exposures – Advanced IRB Approach	Click **Configure** [⚙ Configure] to open the configurations window for this risk-weighted approach. See step 7 to view and populate the fields available in this window.

Field	Description
Credit Risk for Securitization Exposures – Standardized Approach	Click **Configure** [⚙ Configure] to open the configurations window for this risk-weighted approach. See step 7 to view and populate the fields available in this window.
Credit Risk for Securitization Exposures – IRB Approach	Click **Configure** [⚙ Configure] to open the configurations window for this risk-weighted approach. See step 7 to view and populate the fields available in this window.
Market Risk – Standardized Approach	Click **Configure** [⚙ Configure] to open the configurations window for this risk-weighted approach. See step 7 to view and populate the fields available in this window.
Market Risk – Internal Models Approach	Click **Configure** [⚙ Configure] to open the configurations window for this risk-weighted approach. See step 7 to view and populate the fields available in this window.
Operational Risk – Basic Indicator Approach	Click **Configure** [⚙ Configure] to open the configurations window for this risk-weighted approach. See step 7 to view and populate the fields available in this window.
Operational Risk – Standardized Approach	Click **Configure** [⚙ Configure] to open the configurations window for this risk-weighted approach. See step 7 to view and populate the fields available in this window.
Operational Risk – Alternative Standardized Approach	Click **Configure** [⚙ Configure] to open the configurations window for this risk-weighted approach. See step 7 to view and populate the fields available in this window.

3. If you have enabled the **Risk-weighted** Approaches field, then in the required risk-weighted approaches pane, click **Configure** [⚙ Configure] to open the configuration window and populate the form as tabulated.

Table 7: The Configuration form for a Selected Risk-Weighted Approach

Field	Description
Risk Type pane	
Credit Risk	If the risk-weighted approach requires this risk type, then select the checkbox.
Counterparty Credit Risk	If the risk-weighted approach requires this risk type, then select the checkbox.
Capital Calculation Methods pane	
The Capital Calculation Methods that appear in this field depend on if you have the license for the Oracle Financial Services Basel Regulatory Capital Basic or Oracle Financial Services Basel Regulatory Capital IRB application pack and if you selected either BASEL III or BASEL IV in the Regulation field. You must select a value from the drop-down lists.	
Calculation Parameters pane	
The Capital Calculation Methods that appear in this field depend on if you have the license for the Oracle Financial Services Basel Regulatory Capital Basic or Oracle Financial Services Basel Regulatory Capital IRB application pack and if you selected either BASEL III or BASEL IV in the Regulation field. You must select a value from the drop-down lists.	
Portfolio pane	
Select Applicable Portfolios	Select a portfolio from the drop-down list. The portfolios that you created in the Create a Portfolio Definition section appear in this field.

4. Select **Save as Draft** if you want to save a draft of this form.

5. Select **Save**.

5.3.2.3.3 Delete a Run Definition

To delete a run definition, follow these steps:

1. In the **Run Management** window, for the run definition that you want to delete,

   click **Delete** 🗑 .

   A confirmation message appears, asking you if you are sure that you want to delete the run definition.

2. Click **Yes**.

   The portfolio is deleted, and the **Run Management** page is refreshed to display the updated list of run definitions.

5.3.3 Reporting

Oracle Financial Services Basel Regulatory Capital Analytics provides the customer with a reporting-cum-information framework which can be used for generating reports and viewing information relevant to the capital computations and other aspects of the Basel framework. Basel Analytics provides pre-configured Basel dashboards for all the functionalities supported in the application, Pillar II reports covering most of the aspects

related to stress testing and other supervisory review and Pillar III reports covering all market disclosure requirements of the Basel Accord.

For more information on Basel Regulatory Capital Analytics, see the Oracle Financial Services Basel Regulatory Capital Analytics User Guide.

Oracle Financial Services Basel Regulatory Capital Analytics must be licensed by the Bank separately.

6 Bank for International Settlements (BIS)

6.1 Introduction of OFSAA Portfolio Definitions

Every bank has different LOBs and they have different functions. To aid the bank in its efficient management of regulatory calculations, the application has inbuilt portfolio definitions, concerning the banking book and trading book respectively. The different portfolio definitions help in the ease of calculations for the bank, and the parallel processing of the risk-weighted asset calculations. In many of the banks, the ownership of every portfolio might be different, and hence it becomes easier for the maintenance of the ownership for every data point and calculations. The data points concerning every portfolio are different.

The various portfolios concerning Credit Risk are

Credit Risk Non-Securitization

Banking Related Exposures

Investment Related Exposure (only belonging to banking book)

Counterparty Credit Risk – Non-Securitization

Derivative Related Exposures (both banking and trading book exposures)

Securities and Financing Transaction Related Exposures (Both banking and trading book exposures)

Credit Risk Securitization

Securitization Related Exposures (only belonging to banking book)

The portfolio of trading book exposures is the portfolio for Market Risk.

Figure 20: OFSAA Portfolio Hierarchy
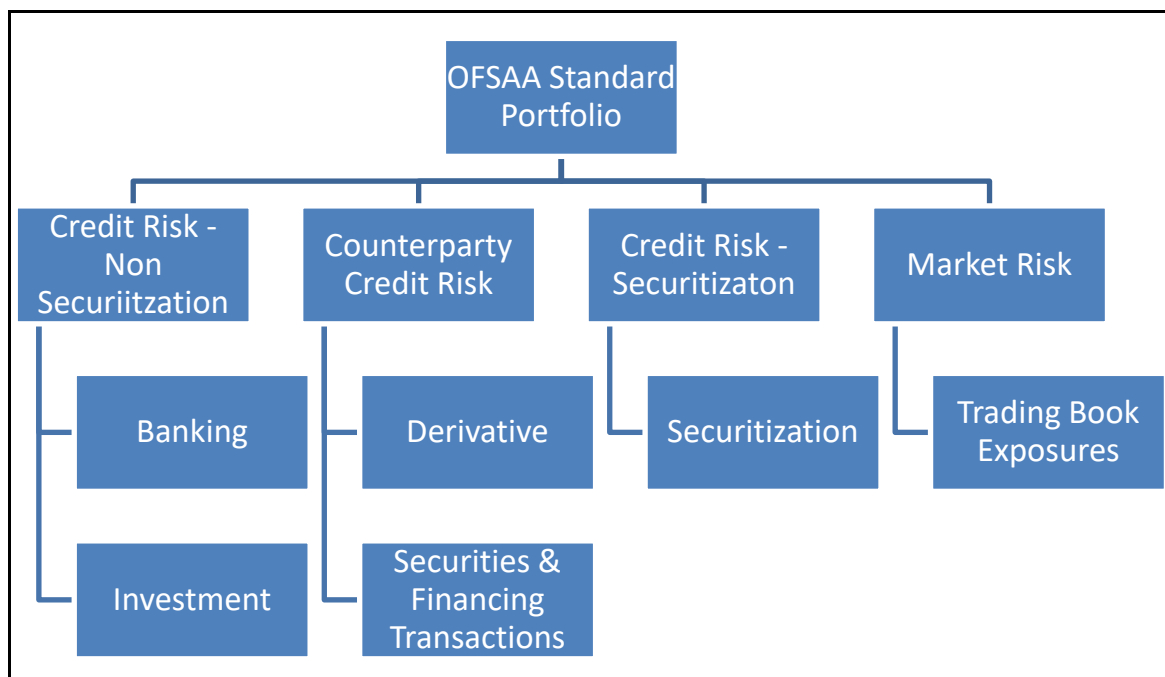
Figure 21: High Level Flow of Processing
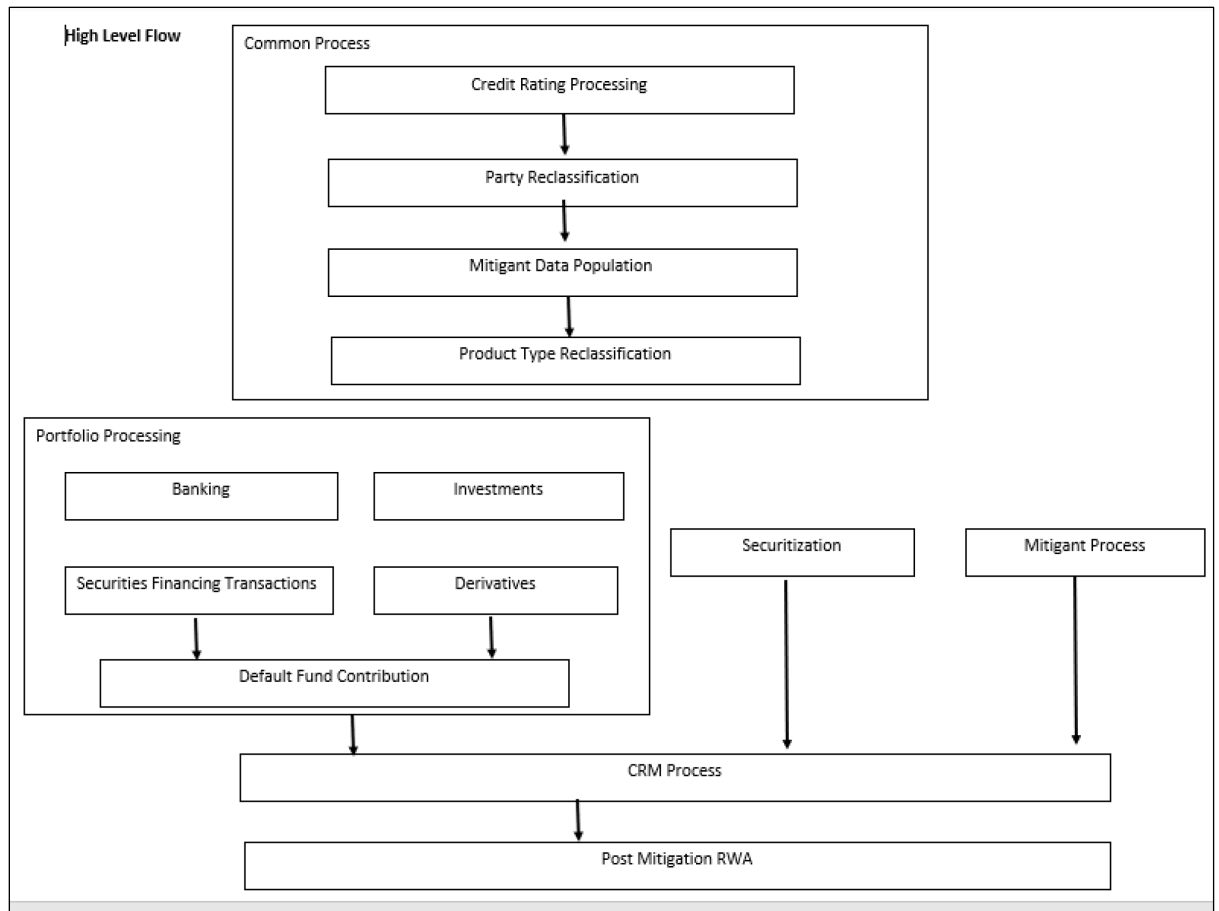
6.1.1 Banking

The Banking portfolio caters to the core banking activities of the bank – be it corporate banking or retail banking. This includes all the various banking activities in the form of loans provided by the bank, cards issued by the bank, commitments issued by the bank, overdraft provided by the bank, and other such core banking specific activities. Since this will be a mandatory portfolio for all the banks, this portfolio has its own RWA calculations.

Figure 22: High Level Flow of Banking Portfolio
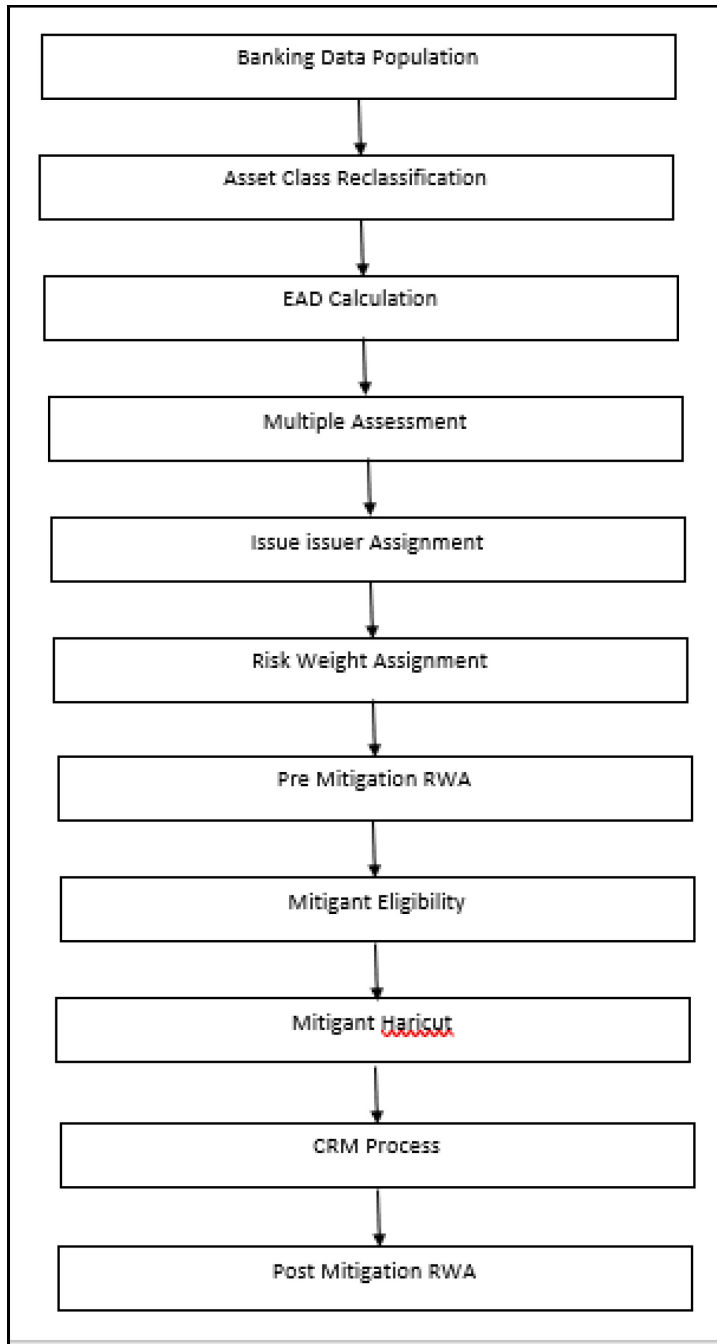
6.1.2   Investment

The Investment portfolio caters to any of the investment activities of the bank, for which the bank holds the assets till maturity. These are the exposures that the bank will portray in the banking book. This includes all the investment in the form of any money market instruments or spot instruments or debt securities, held by the bank till maturity, and hence considered to be in the banking book. This also includes the bank's investment in the form of fixed assets as well. This will be applicable only if the bank holds exposures in the form of investment related to the banking book.

Figure 23: Process Flow for Investment Portfolio
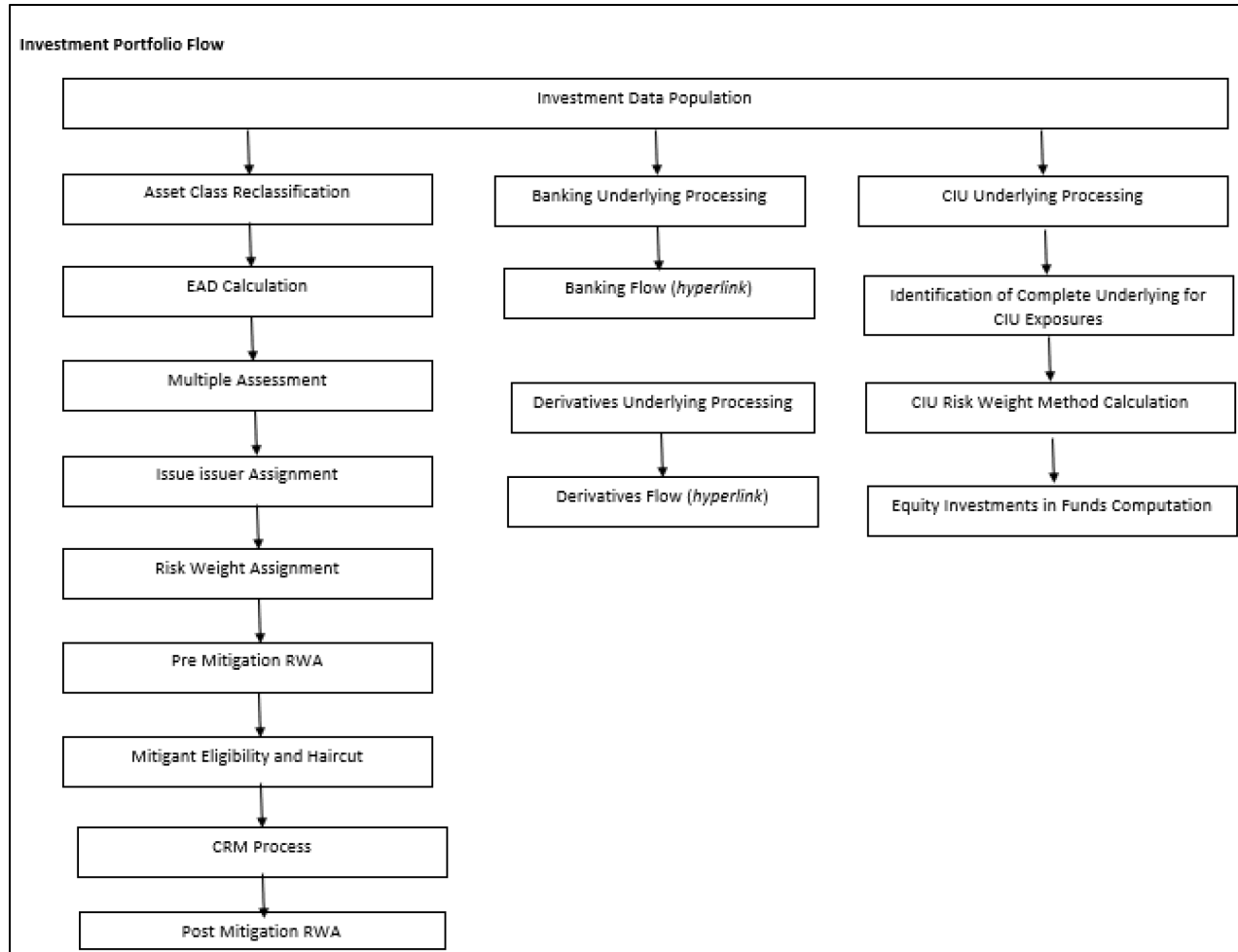
6.1.3 Derivative

The derivative portfolio caters to any of the derivative activities of the bank. These are the derivatives for which the bank is one of the counterparties or the bank acts as a clearing member or clearing member client. This includes derivatives in the form of credit derivatives, forwards, futures, options contracts, and swap contracts. This will include both the banking and trading book-related derivative exposures.

Figure 24: Process Flow for Derivatives
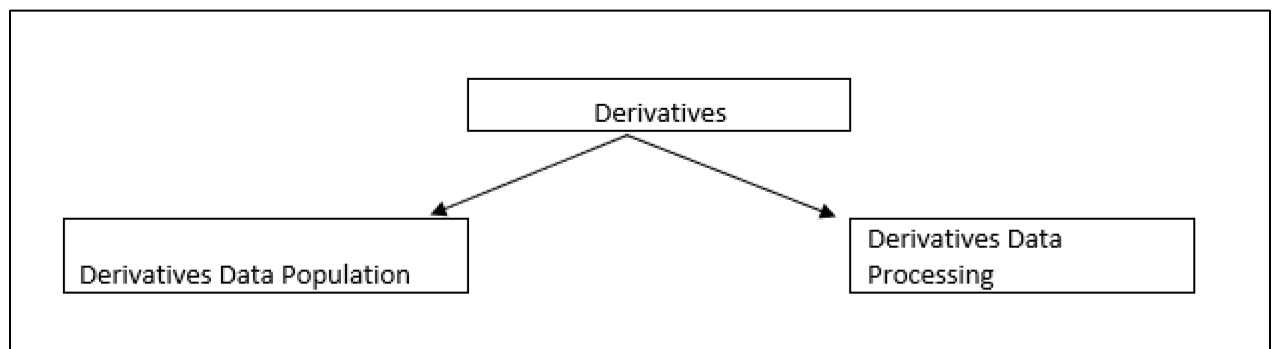
6.1.4 Securities and Financing Transactions

The Securities and Financing Transactions (SFT) portfolio caters to any of the securities financing activities of the bank. These are the SFT which the bank enters into, or the bank acts as a clearing member or clearing member client. This includes SFT in the form of repurchase agreements, reverse repurchase agreements, margin lending transactions, securities lending, and borrowing transactions. This will include both the banking and trading book-related exposures.

Figure 25: Process Flow for SFT
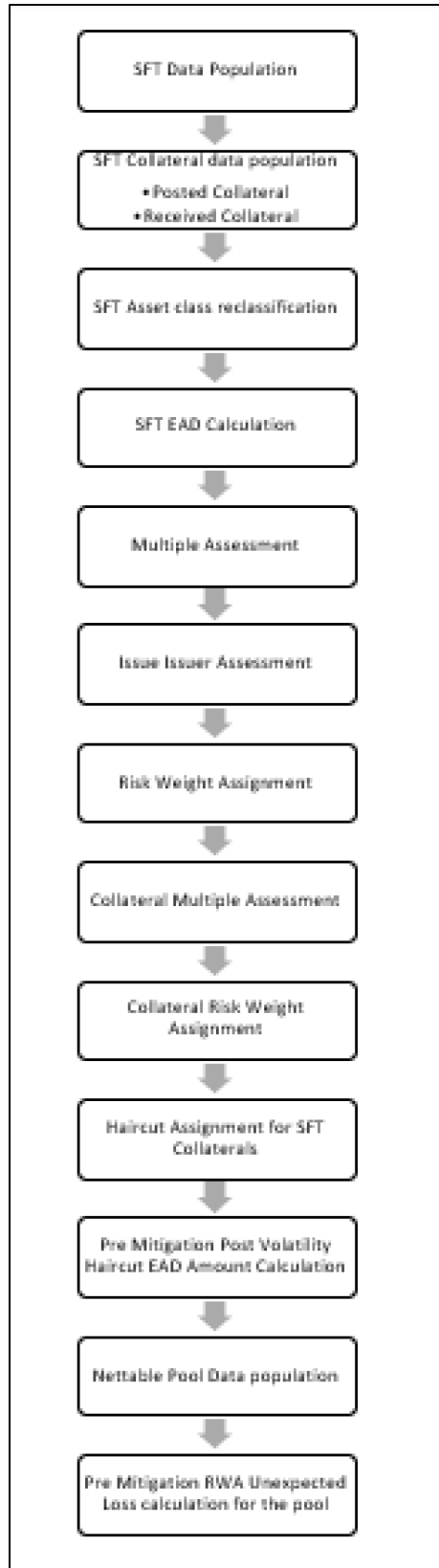
6.1.5   Securitization

The Securitization portfolio caters to the securitization activities of the bank, wherein the bank either acts as an investor/ originator/ sponsor, or in the form of any other party wherein the bank provides some credit enhancement or commitment to the securitization transaction. This includes banking book-related exposures.

Figure 26: Process Flow for Securitization

OVERVIEW OF BASEL III
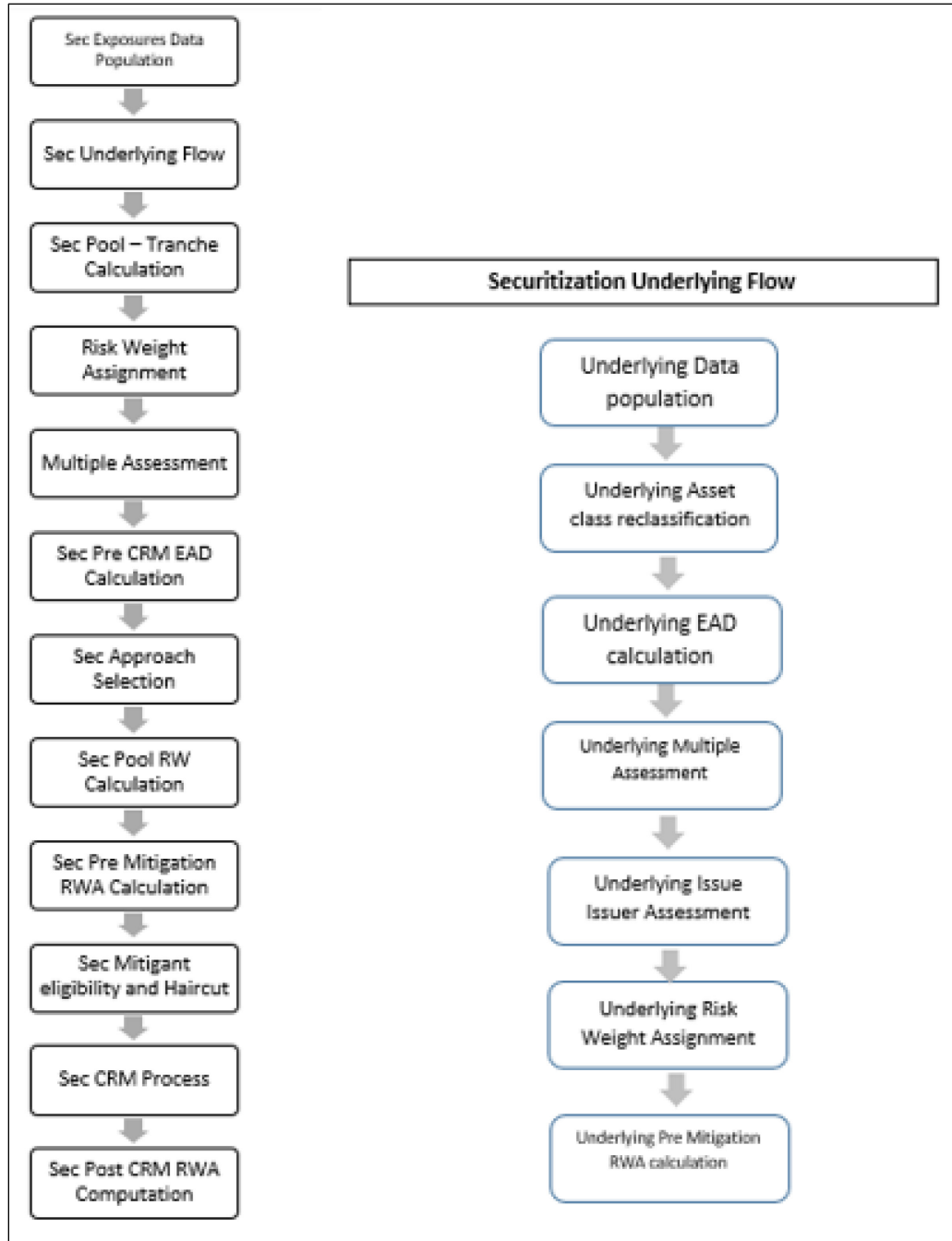
6.1.6　Market Risk

The Market risk related portfolio caters to all the trading book exposures. This includes all the exposures in the form of investments (including money market and spot transactions), derivative transactions, securitization transactions.

6.2　Overview of Basel III

The Basel Committee (BIS) published guidelines that encompass guidelines for capital adequacy. Concerning Capital Adequacy, multiple guidelines have been published from Basel committee from time to time, and the OFS Basel Regulatory Capital complies with all the latest guidelines that must be complied with, by the bank. The various guidelines are the ones listed below:

- International Convergence of Capital Measurement and Capital Standards - June 2006

- Revisions to the Basel II market risk framework - December 2010

- Basel III: A global regulatory framework for more resilient banks and banking systems - December 2010

- Capital requirements for banks' equity investments in funds - December 2013

- Basel III leverage ratio framework and disclosure requirements - January 2014

- The standardized approach for measuring counterparty credit risk exposures - March 2014

- Capital requirements for bank exposures to central counterparties - April 2014

- Supervisory framework for measuring and controlling large exposures - April 2014

- Revisions to the securitization framework - December 2014

- Minimum capital requirements for market risk - January 2016

The various functions that are encompassed as part of OFS Basel Regulatory Product are as follows:

Figure 27: Functionalities of Capital Adequacy
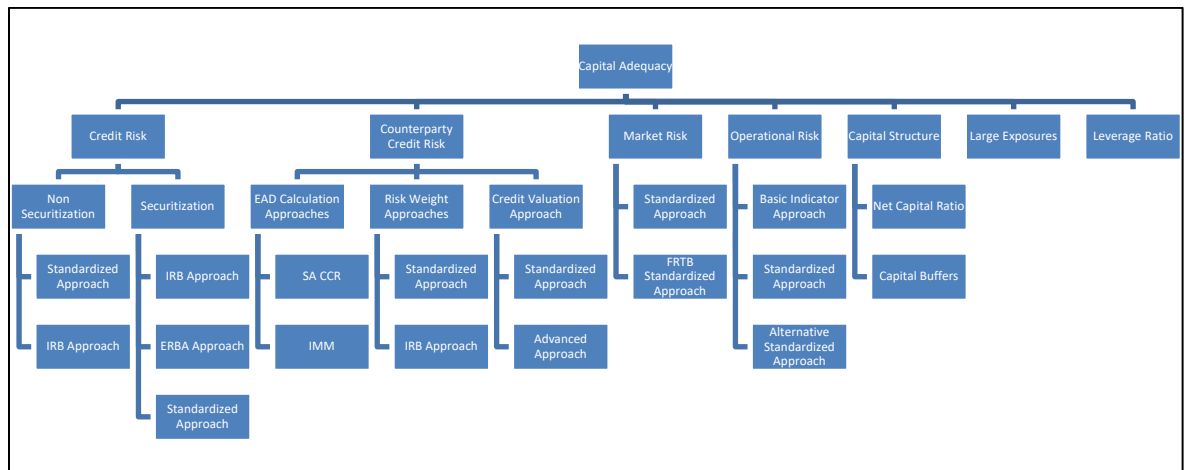
6.2.1 Credit RWA

Credit RWA is the calculation of Non-securitization RWA.

This includes the portfolio of banking and investment for the non-securitized exposures and securitization portfolio for the securitization positions. The application complies with the standardized approach and IRB approach of the credit risk calculations.

A few processes such as Credit Rating, Party Type Reclassification, and Mitigant Data Population are common between. Credit RWA and Counterparty Credit RWA.

This also includes the settlement risk calculation about the unsettled transactions depending on the number of days they are unsettled.

6.2.2 Counterparty Credit RWA

Counterparty Credit RWA is the calculation of the counterparty credit risk exposures. This includes the derivative portfolio and the Securities and Financing transaction portfolio. This also includes the exposures in both banking book and trading book.

6.2.3 Default Fund Contributions Related Capital Charge

A default fund contribution refers to the funds contributed, or commitments made by a clearing member to a Central Counterparty's (CCP) equalized loss-sharing agreement. The purpose of such default funds is to provide capital, in addition to the collateral posted by participants and in addition to capital provided by the clearinghouse, as a safeguard against extraordinary losses that might occur in connection with. The application also helps in the computation of the default fund related capital charges.

6.2.4 Credit Valuation Adjustments

The mark to market counterparty credit losses or the spread migration risk is captured with CVA, which was not directly capitalized before. CVA is the difference between the risk-free portfolio value and the true portfolio value that takes into account the possibility of the counterparty's default. In other words, CVA is the market value of counterparty credit risk.

The application calculates CVA Charge for the OTC portfolio of a bank. When using the standardized approach, it is calculated at the portfolio level and for the advanced approach, it is calculated at the counterparty level. CVA Charge does not apply to the trades with the central counterparty and structured finance transactions. Structured financial transactions are applicable only if the supervisor specifically mentions the same.

6.2.5 Credit RWA for Securitization

The application also complies with the required calculations for the securitization portfolio. This is dependent on the revised guidelines for securitization, which focused on addressing the shortcomings of the existing guidelines. This calculation complies with the underlying securitization being part of the banking portfolio and being part of either bank's assets or assets of other banks.

6.2.6   Market Risk RWA

The Basel Committee had introduced Market Risk Capital Charge calculation in 1996 as an amendment to the earlier Basel accord by considering the risk borne by a financial institution having exposures in the trading book. BIS defines Market Risk as "the risk of losses in the on and off-balance-sheet positions arising from movements in market prices". It is the risk that arises out of the adverse movements of the market factors. Market risk consists of the risk borne by the bank due to the positions in its trading book.

6.2.7   Operational Risk RWA

As per the Basel accord, "Operational Risk is the risk of loss resulting from inadequate or failed internal processes, people and systems, or external events". External losses can occur due to theft of information or hacking of systems. The Basel accord has prescribed three methods for calculating Operational Risk capital charges and banks can use any of these methods to calculate capital charge:

- Basic Indicator Approach

- Standardized Approach

- Alternative Standardized Approach

Figure 28: Process Flow for Operational Risk Portfolio
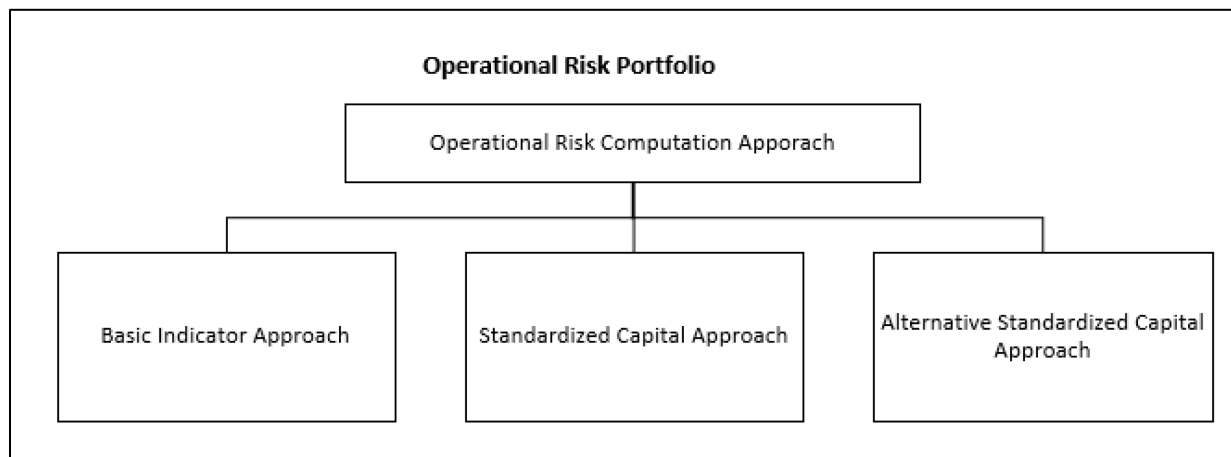
6.2.8   Capital Structure

During the economic crisis, the global banking system had an insufficient level of high-level quality capital. During the crisis, it was identified that there was inconsistency in the definition of capital across jurisdictions and lack of disclosure. To address this issue of inconsistency, the Basel committee has prescribed a new definition of capital to strengthen the global capital framework under Basel III.

As per the new definition in the Basel III accord, total capital consists of some of the following elements:

- Tier1 Capital that consists of

- Common Equity Tier 1

- Additional Tier 1

- Tier 2 Capital

Figure 29: Process Flow for Capital Structure
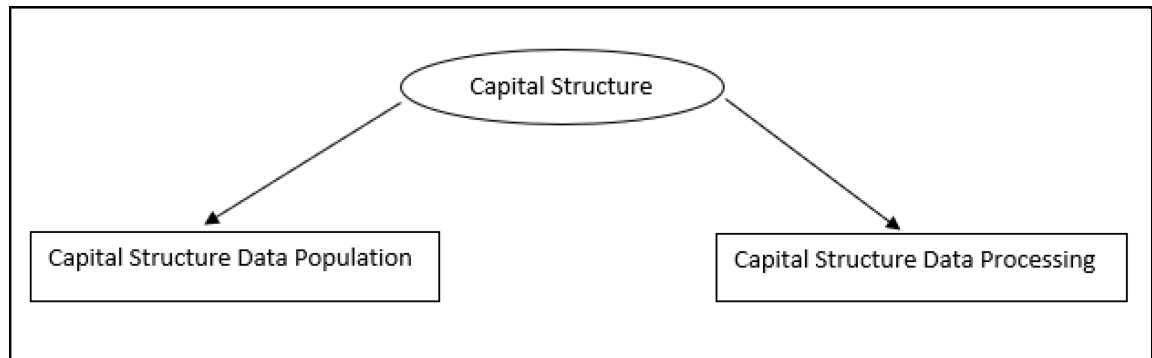
6.2.9   Capital Buffers

Capital Buffer is calculated after the calculation of Capital Ratios, as they go as an input to Buffer calculation. The application complies with the various buffer calculations of Capital Conservation Buffer, Countercyclical Buffer, and GSIB Buffers.

Figure 30: Process Flow for Capital Buffers
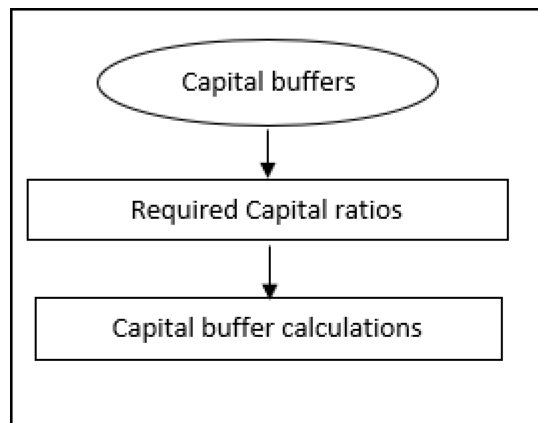
6.2.10   Large Exposures

The large exposure framework is a framework detailing how the banks have to manage their exposures to various parties both at the individual level, as well as to the group of connected clients' level.

The large exposure framework has to have complied with the bank at both solo and consolidated level. As part of the solo execution, the bank has to identify its large exposures and comply within the required threshold limit. And as part of the consolidation execution, the bank has to identify the total large exposures at the consolidated level and comply within the required threshold limit.

The solo and consolidation are as per the regulatory definition, and the same as the one which is being used for the regular capital adequacy.

The large exposures are identified based on the comparison of the total individual party's exposures to the Tier 1 Capital, which changes based on whether it is a solo execution or consolidation execution.

6.2.11 Leverage Ratio

During the financial crisis, banking institutions built-up excessive on-balance sheet and off-balance sheet leverage which forced the banking sector to reduce its leverage. To prevent the building of excessive leverage on the institutions' balance sheet, the BIS has introduced a non-risk-based leverage ratio which is a new regulatory tool supplementing risk-based capital requirement. The application calculates the leverage ratio for a reporting bank. The minimum required leverage ratio is 3%.

The leverage ratio is calculated by dividing an institution's Tier 1 capital measure by the total leverage exposure measure.

$$\textbf{Leverage Ratio} = \frac{\textbf{Tier 1 Capital}}{\textbf{Leverage Exposure Measure}}$$

7 SAMA Basel III Standardized Approach

Capital Adequacy guidelines as issued in the following regulations are incorporated in OFS Financial Services Basel Regulatory Capital:

- **BIS Jurisdiction**: International Convergence of Capital Measurement and Capital Standards, June 2006.

- **Basel III**: A global regulatory framework for banks that are more resilient and banking systems, Dec 2010 (rev June 2011).

This approach covers the following topics:

- Credit RWA

- Counterparty Credit RWA

- Default Fund Contributions Related Capital Charge

- Credit Valuation Adjustments

- Credit RWA for Securitization

- Market Risk RWA

- Operational Risk RWA

- Capital Structure

- Capital Buffers

- Large Exposures

- Leverage Ratio

7.1 Credit RWA

Credit RWA is the calculation of Non-securitization RWA.

This includes the portfolio of banking and investment for the non-securitized exposures and the securitization portfolio for the securitization positions. The application complies with the standardized approach and IRB approach of the credit risk calculations.

A few processes such as Credit Rating, Party Type Reclassification, and Mitigant Data Population are common between Credit RWA and Counterparty Credit RWA. This also includes the settlement risk calculation about the unsettled transactions depending on the number of days they are unsettled.

7.1.1 Banking Portfolio

7.1.1.1 Rating Population

The data on ratings is captured in the following rating specific tables:

- Account Rating Table (**STG_ACCOUNT_RATING_DETAILS**)
  - Ratings of all Credit Risk Banking Exposures are captured in this table.

- Party Rating Table (**STG_PARTY_RATING_DETAILS**)

  - Credit Rating for all customers and issuers are captured in this table.

- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)

  - Credit Rating for all countries is captured in this table.

7.1.1.1.1 Processing Steps

Banks obtain credit ratings from different sources and these are provided as input in the application through the rating tables mentioned in the preceding list.

This is handled in the sub-process **RATING_RECLASSIFICATION_POPULATION** in **SAMA Other Reclassifications** process**.**

The application re-classifies the rating information to BIS Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short Term ratings.

This is handled in the sub-process **Credit Rating Reclassification** in **SAMA Other Reclassifications** process**.**

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables.

Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

Ensure that all the columns as indicated in the DL Specs are mandatorily populated with data. For example, in the Stage Party Rating Details (**STG_PARTY_RATING_DETAILS)** table: Rating source code (**V_RATING_SRC_CODE**), Party Code (**V_PARTY_CD**), Purpose (**V_PURPOSE**) are required to be populated. The purpose code is to indicate whether the rating is a domestic rating or a foreign rating. If any other rating is provided, then the exposure is considered unrated.

7.1.1.2 Data Population

Credit Risk exposures are updated in the application for all the product types through their respective input tables known as Product Processors. The main categories of Credit Risk Banking exposures along with their respective table names that are used as input are as follows:

Figure 31: Data Population for Credit Risk Banking Exposures

SAMA BASEL III STANDARDIZED APPROACH

CREDIT RWA

Product	Source Product Processor
Assets Sold	STG_ASSETS_SOLD
Bills	STG_BILLS_CONTRACTS
Credit Cards	STG_CARDS
Guarantees	STG_GUARANTEES
Lease Contracts	STG_LEASE_CONTRACTS
Letters of Credit	STG_LC_CONTRACTS
Line of Credit	STG_CREDIT_LINE_DETAILS
Commitment Contracts	STG_COMMITMENT_CONTRACTS
Loans	STG_LOAN_CONTRACTS
Overdraft	STG_OD_ACCOUNTS

There is a data population for mitigants that adheres to all types of mitigants such as collateral, guarantee, and credit derivatives. There is another data population for the counter-guarantee for the guarantor.

Figure 32: Data Population for Mitigant and Counter Guarantee Data Population

Product	Source Product Processor
Mitigants – Collateral, Guarantee, Credit Derivatives	STG_MITIGANTS
Counter Guarantee	STG_MITIGANT_COUNTER_GUARANTEE

The data population for the mapping between the exposures and the mitigants is the listed in the following table:

Figure 33: Mitigant and Counter Guarantee Data Population

Product	Source Table
Mapping for Exposures and Mitigants	STG_ACCOUNT_MITIGANT_MAP

Processing table details

All Credit Risk Banking exposures are loaded into the table, FSI Cap Banking Exposures (**FSI_CAP_BANKING_EXPOSURES)** where further processing happens for this portfolio of exposures till the computation of the Pre-Credit Risk Mitigation process.

This is handled in the process **Banking Data Population**.

7.1.1.3 Shareholding Percent Multiplication

Shareholding percent multiplication for common entity-level data is a part of the **BIS Common Data Processing** (PMFCOM020) process. In this process, the application updates the shareholding percentage against each entity is updated with the value of 1 as the shareholding percent and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PERCENT).

OFS BASEL REGULATORY COMPLIANCE FOR SAMA | 56

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity concerning the parent entity against exposure amount, undrawn amount, and provision amount for that exposure and updates the same.

This is handled in the sub-process **BNK_SHAREHOLDING_CALCULATION_STD of the process SAMA Banking Data Processing – STD**.

7.1.1.4　Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, the asset class for each exposure is arrived at. Similarly, the application does reclassification for mitigant based on its mitigant types and reclassifies it to standard mitigant types.

Ensure that all products, party types, and mitigants that are bank-specific are reclassified as part of the setup activity. If they are not reclassified, the treatment might not happen as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product types. For Example, Housing Loan is reclassified as Residential Mortgage Exposure.

This is handled in the **Basel Product Type Reclassification which is part of the COMMON_RECLASSIFICATION** process.

Party Type Reclassification

Similar to the product type, the customer type (which is stored as counterparty type) is also reclassified as the standard counterparty type. The customer information is expected in the Stage Party Master (STG_PARTY_MASTER), and this also includes the Party Type based on the Stage Party Type Master (STG_PARTY_TYPE_MASTER).

Party type reclassification Rules handle reclassification for customer types. For Example, an Individual is reclassified as Retail.

This is handled in the **Party Type Reclassification w**hich is part of the **SAMA Other Reclassification** process.

Other Reclassification

As part of the reclassification rules, any other data that is brought inside the application such as seniority, transaction type, and so on also gets reclassified into OFSAA specific values. You must perform this activity as data can be unavailable for processing as required by the regulator. This happens as part of the process **COMMON_RECLASSIFICATION**.

7.1.1.5　Asset Reclassification Rules

Based on Basel product type and standard counterparty type, an asset class is formed by the application. This asset class is used for data processing. The asset class is the same as specified in the accord.

For example, Standard counterparty is Corporate non-SME and Corporate SME, the asset class is corporate. For Basel product type Residential Mortgage Exposure, the asset class is Claims Secured by Residential Real Estate.

The asset class for all mitigants is reclassified based on their standard mitigant types and standard issuer type.

This happens in the **BNK_RECLASSIFICATION_STD** sub-process of the process **SAMA Banking Data Processing-STD**.

7.1.1.6   Pre-mitigation Calculations

Based on the asset class, the application calculates the Pre-Credit Risk Mitigation (CRM) Exposure at Default (EAD) for each exposure. This value signifies the maximum loss that the bank can suffer, in case of default on this exposure, before considering any mitigation effects.

Some exposures can be hedged against credit risk through various mitigants such as guarantees, collaterals, credit derivatives, and so on. These provide mitigation to credit risk and must be considered while computing Credit RWA, as per the Accord. Hence, the application calculates the pre-mitigation exposure amount and post-mitigation exposure amount.

The application also computes pre-mitigation risk-weighted assets (Pre CRM RWA) and post-mitigation risk-weighted assets (Post CRM RWA) by multiplying the respective EAD by risk weight. The risk weight is arrived at, by considering the credit rating of the exposures and mitigants as per the guidelines.

7.1.1.6.1   Exposure at Default Amount Calculation

Pre CRM EAD

Exposure at Default (EAD) is calculated for all the products. This is being computed using the Exposure Amount (EOP Balance of the Exposure), Undrawn Amount of the Exposure (Undrawn Amount), and the Credit Conversion Factor for the Off-Balance sheet Amount (CCF). This is computed for the on-balance sheet products separately, and the off-balance-sheet products separately.

This happens in the sub-process **BNK_PRE_CRM_EAD_COMPUTATION_STD** in **SAMA Banking Data Processing – STD** process.

Credit Conversion Factor (CCF Assignment)

This is an input required for converting the off-balance sheet component of the exposure (undrawn portion associated with an on-balance sheet or off-balance sheet product, or the exposure amount of an off-balance sheet product). This is based on the supervisory provided values and is determined based on the product type and the maturity associated with the exposure.

This populates the Drawn CCF (for the CCF to be assigned to the exposure amount of the off-balance sheet product) and the Undrawn CCF (for the CCF to be assigned to the undrawn portion of the on-balance sheet and off-balance sheet exposures).

This happens in the process **BNK_CCF_ASSIGNMENT_STD** in **SAMA Banking Data Processing – STD** process.

Post CRM EAD

Through the CRM process, the bank considers the effect of the mitigation and calculates the post-mitigation exposure at the default amount. This signifies the maximum loss that the bank can suffer in case of default on this exposure, after considering the effects of the mitigation. This will be the EAD of the Exposure Pre-Mitigation less the covered portion of the mitigant

7.1.1.6.2   Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment processes. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessments are first moved into the table FSI Multiple Rating Processing (**FSI_MULTIPLE_RATING_PROCESSING)** wherein the ranking and final selection of which rating to use takes place.

This occurs in the sub-process of **BNK_MULTIPLE_ASSESSMENT_PROCESSING_DATA_POPULATION** where the data for the multiple assessment processing gets populated into the FSI table. The identification of the multiple rating for the exposure occurs in MULTIPLE_RATING_ASSESSMENT, and the actual risk weight and final rating assignment occurs the exposures in **BNK_MULTIPLE_ASSESSMENT_BASED_RISK_WEIGHT_ASSIGNMENT**.

All these sub-processes belong to the **SAMA Banking Data Processing – STD** process.

7.1.1.6.3   Issue Issuer Assessment

For all the exposures that remain unrated after the multiple assessment processes, the issue issuer process is performed. This occurs in the Issue Issuer Assessment sub-process (**SAMA_BNK_ISSUE_ISSUER_ASSESSMENT**). In this case, the unrated exposures are assigned a reference rating based on the reference issue available or the rating of the party whichever is applicable. These unrated exposures are assigned a risk weight based on the reference rating.

For unrated Banking exposures, the application performs an issue-issuer assessment to infer a rating of the unrated exposures that is based on the rating of a similar instrument (referred to as reference issue hereafter) issued by the same issuer. The reference issue is used only when it is of the same currency as the exposure, and the exposure is senior or equivalent to the same. For the unavailable reference issue, the party rating is used. In the case of the party also being unrated, the exposure remains unrated. Also, the application populates whether the exposure is LT rated or ST rated based on the rating assigned to the exposure.

7.1.1.6.4   Risk Weight Assignment Rules

Banking Exposures Risk Weight

Risk Weight is assigned based on asset class and the credit rating as per Basel guidelines. The risk weight rules operate on the risk weight table (**FSI_RW_MAP_MASTER**). Highly rated exposures are allocated low-risk weight and poorly rated exposures are allocated high-risk weights. If exposure has more than one rating (rated by more than one agency), then the final rating is assigned based on multiple assessments. The application updates the risk weights against the exposures directly, when ratings are not considered.

Options for risk-weighting are selected during Run definition if the Run Management UI is used, to update the required calculations as allowed by the specific jurisdiction. For information on the options, see the Run Management section.

Figure 34: Process Flow for Risk-Weight Assessment
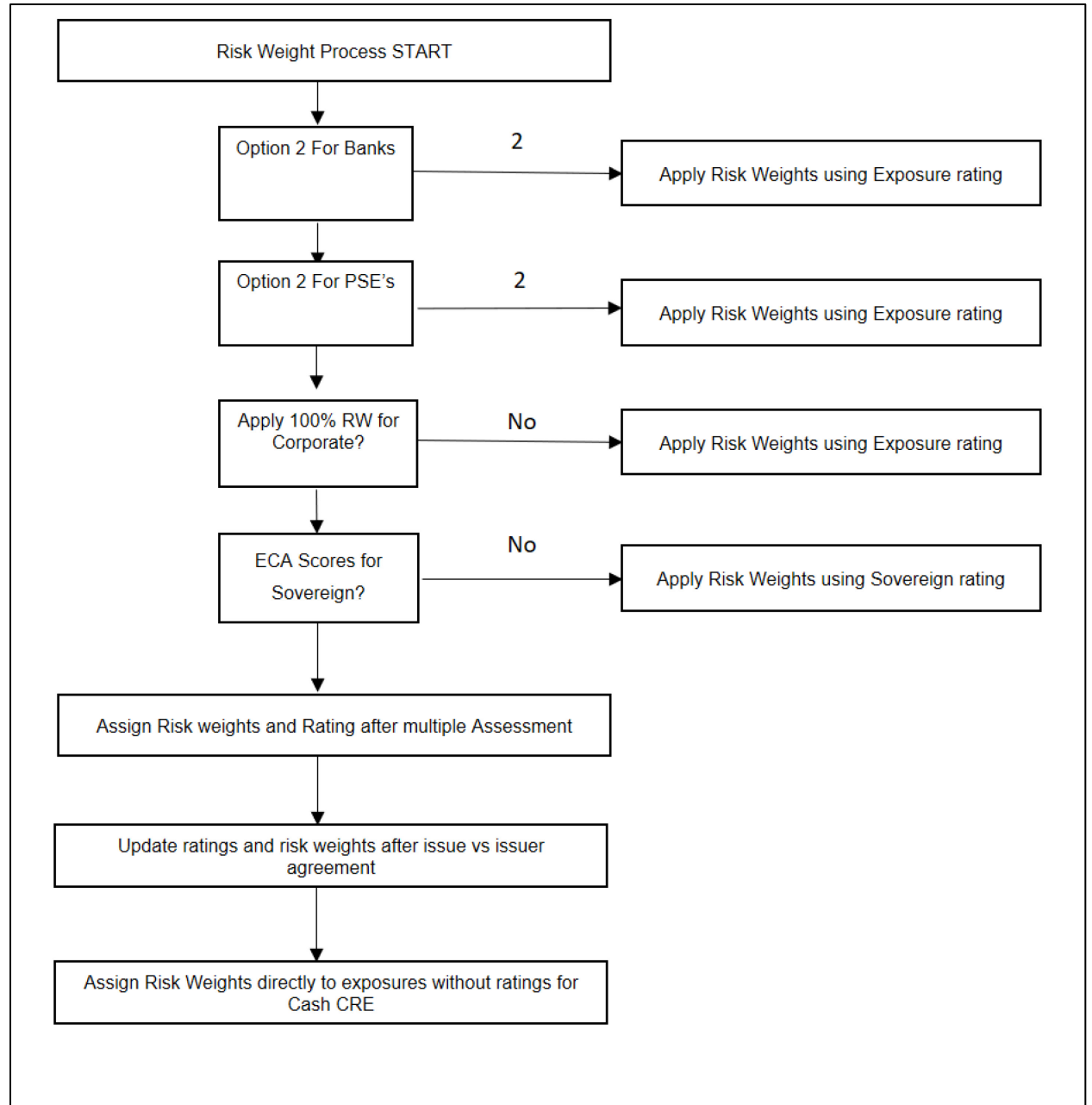
Risk weight assignment takes place in the sub-process:
SAMA_BANKING_RISK_WEIGHT_ASSIGNMENT_STD of the **SAMA Banking Data Processing – STD** process.

7.1.1.6.5   RWA Calculations

The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight.

This is handled under the sub-process **BNK_PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_STD** of the **SAMA Banking Data Processing – STD** process.

7.1.1.7   Credit Risk Mitigation Process

To calculate the post-CRM RWA, the application needs to account for mitigants that could be in the form of collaterals, guarantees, and credit derivatives. All mitigants are not eligible for RWA computation. All the mitigants that get populated into the system are being made ineligible, and then the regulatory approved mitigant types, and the issuer type combination are made eligible.

7.1.1.7.1   Mitigant Processing

Mitigant Data population

Mitigant data is loaded from the Stage Mitigant table (STG_MITIGANTS) into the FSI CAP Mitigants table (FSI_CAP_MITIGANTS) where further processing takes place. This occurs in the sub-process **Mitigant Data Population** under the process **SAMA Mitigant Data Processing.**

Mitigant Multiple Assessment

Similar to exposures with multiple ratings, mitigants with multiple ratings are also subjected to Multiple rating Assessment. This is handled under the sub-process **Asset Class Based Mitigant Multiple Rating Assessment** of the process **SAMA Mitigant Data Processing - Standardized .**

7.1.1.7.2   Mitigant Approaches and their Risk Weighting Rules

Mitigant Risk Weight

Based on the Asset class of the Mitigant the relevant Risk Weight are assigned in the sub-process **Asset class Based Mitigant Multiple Assessment Risk Weight Assignment** in the process **SAMA Mitigant Data Processing – Standardized**. Also, the application assigns the risk weight to mitigants based on the various asset classes where it assigns the risk weight to selective Mitigant types such as Cash, Cash in process, Equity and Gold (**CAP Mitigant Risk Weight Assignment for Asset Classes - STD**), and for Nettable Liabilities (**CAP Mitigant RW Assignment for Nettable Liabilities**). The sub-processes belong to the process **Post Crisis Mitigant Risk Weight Assignment** and are applicable for Simple and Comprehensive approaches.

In the Comprehensive approach, for Mitigant types such as financial collaterals is handled in **CAP Mitigant RW Assignment for Financial Collaterals - Comprehensive Approach**. This belongs to the process **Post Crisis Mitigant Risk Weight Assignment**.

Mitigant Eligibility

The application identifies the eligible mitigants based on the criteria as mentioned by the Regulator. The application identifies the following standard mitigants– collateral, guarantees, and credit derivatives.

The application is capable of using the Simple Approach and the Comprehensive Approach for the mitigants which are part of the collateral. The application identifies the eligibility of the financial collateral separately for the simple approach and the comprehensive approach. The eligibility of the collateral mitigants are based on the party type of the mitigant, mitigant types, the credit rating assigned to the mitigant or the party (as applicable), and the classification of collateral as senior or not.

For equity, the eligibility is based on the main index equity and the equity trading status. This is handled in **CAP Collateral Eligibility - Simple Approach - Equity** under the process **PCR Mitigant Eligibility - Simple Approach - ECRA**.

The application identifies the eligibility of the guarantees and credit derivatives based on the party type of the mitigant and the credit rating assigned to the issuer of the mitigant. This is handled in **CAP Mitigant**

Eligibility - Based on Rating for Mitigant Covering Securitization Transactions - ECRA under the process **PCR Mitigant Eligibility - Simple Approach - ECRA**

Similar mitigant eligibility rules for Comprehensive Rule can be found in the **process PCR Mitigant Eligibility - Comprehensive Approach - ECRA**

The option for the bank to select Collateral Simple Approach or Comprehensive Approach is based on the Run Management option as selected in the application.

7.1.1.7.3   Mitigant Haircut Assignment

In the Standardized approach, the bank has to follow supervisory estimates for Mitigant Haircut assignment. This is based on various categories such as mitigant type, residual maturity, rating, issuer type, and so on. This is applicable only if the bank follows the Comprehensive approach for collateral.

Only eligible mitigants are considered for haircut assignment and further processing. In Post haircut assignment, the eligible mitigants are moved from the mitigants table (**FSI_CAP_MITIGANTS**) to the sub exposures table (**FSI_CAP_SUB_EXPOSURES**).

The application performs computations for three kinds of mitigant haircuts: volatility haircut, FOREX haircut, and maturity mismatch haircut.

Volatility Haircut

Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. The application assign haircuts for various type of financial collateral like debt securities, equity, mutual funds, and so on. In the supervisory haircut method, the application assigns volatility haircut based on issues, issuer's ratings, mitigant's residual maturity, and type of mitigant.

This is handled in the following processes:

- CRM Mitigant Volatility Haircut for Collateral - Supervisory Haircut

- CRM Mitigant Volatility Haircut for Cash and Gold - Supervisory Haircut

- SAMA - CAP CRM Mitigant Volatility Haircut for Equity - Supervisory Haircut

- CAP CRM Underlying Mitigant Volatility Haircut Assignment and CAP CRM Mitigant Volatility Haircut for Mutual Fund - Supervisory Haircut

These sub-processes belong to the **Mitigant Haircut Assignment - Comprehensive Approach** process.

Forex Haircut

If the exposure and collateral are in different currencies, then the application adjusts by applying the FOREX haircut.

This is handled in the sub-process **CAP CRM Forex Haircut** of the process **CRM Sub Exposure Data Haircut Assignment**.

Maturity Mismatch Haircut

If the residual maturity of the Credit Risk Mitigant is less than that of the underlying credit exposure, then a maturity mismatch haircut is applied to adjust the value.

This is handled under **CAP CRM Maturity Mismatch Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

7.1.2   Investment Portfolio

7.1.2.1   Rating Population

The data on ratings is captured in the following rating specific tables:

- Instrument Rating Table (**STG_INSTRUMENT_RATING_DETAILS**)

  - Ratings for investment exposures subject to credit risk (one that is in **STG_INVESTMENTS**) and mitigants are captured in this table.

- Party Rating Table (**STG_PARTY_RATING_DETAILS**)

  - Ratings for the customer are captured in this table.

- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)

  - Credit Rating for all countries is captured in this table.

- External Underlying Exposures Rating Table (**STG_EXT_ULY_ACCT_RATING_DTL**)

  - Credit Rating for all external underlying exposures is captured in this table. In the case of underlying exposures of CIU transactions, it is expected that the value of Exposure ID is that of the instrument ID to which the underlying exposures belong. For example, if the Underlying Exposure ID EXP001 belongs to the instrument INSTR001, and has the parent ID as PARENT001, the data expected in this table is of the instrument INSTR001 with the Exposure ID as INSTR001.

7.1.2.1.1   Processing Steps

Banks obtain credit ratings from different sources and these are provided as input in the application through the rating tables mentioned in the preceding list.

This is handled in the sub-process **RATING_RECLASSIFICATION_POPULATION** in the **SAMA Other Reclassifications** process.

The application re-classifies the rating information to BIS Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short Term ratings. This is handled in the sub-process **Credit Rating Reclassification** in **SAMA Other Reclassifications** process**.**

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables. Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

Ensure that the following columns are mandatorily populated with data in the **STG_PARTY_RATING_DETAILS** table: Rating source code (**V_RATING_SRC_CODE**), Party Code (**V_PARTY_CD**), Purpose (**V_PURPOSE**): In this field whether the rating is a domestic rating or foreign rating must be indicated. If any other rating is provided, then the exposure is considered unrated.

7.1.2.1.2   Data Population

The following are the preprocessing steps:

Credit Risk exposures are updated in the application for all the product types through their respective input tables known as Product Processors. The categories of Credit Risk Investment exposures along with their respective table names used as input are as follows:

Table 8: Categories of Credit Risk Investment Exposures

Product	Source Product Processor
Investment Products:	STG_INVESTMENTS
Money Market Instruments	STG_MM_CONTRACTS
Spot Forex Transactions	STG_FX_CONTRACTS
Fixed Assets	STG_FIXED_ASSETS

7.1.2.2   Data Population

There is a data population about the mitigants, which cater to all the types of mitigants like collateral, guarantee, and credit derivatives. There is one data population about the counter-guarantee for the guarantor.

Table 9: Data Population for Mitigants

Product	Source Product Processor
Mitigants – Collateral, Guarantee, Credit Derivatives	STG_MITIGANTS
Counter Guarantee	STG_MITIGANT_COUNTER_GUARANTEE

There is a data population for the mapping between the exposures and the mitigants.

Table 10: Data Population for Mapping between Exposures and Mitigants

Product	Source Table
Mapping for Exposures and Mitigants	STG_ACCOUNT_MITIGANT_MAP

In the case of investments in funds (CIUs), the underlying of the CIU is captured in either of the below tables, depending on the data availability.

Table 11: Categories of Investments in Funds

Product Type	Source Product Processor
Underlying composition Details of CIU	STG_FUND_CIS_COMPOSITION
Underlying Exposures of CIU	STG_FUND_UNDERLYNG_COMPOSITION

Processing table details

All Credit Risk Investment exposures are loaded into the table, FSI CAP Investment Exposures, **FSI_CAP_INVESTMENT_EXPOSURES** where further processing happens for this portfolio of exposures till the computation for the Pre Credit Risk Mitigation process.

This is handled in the process **Investment Data Population**.

7.1.2.3 Shareholding Percent Multiplication

Shareholding percent multiplication for common entity-level data is a part of the **SAMA Common Data Processing** (PMFSAM002) process. In this process, the application updates the shareholding percentage against each entity. The parent entity is updated with the value of 1 as the shareholding percent and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PERCENT).

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity concerning the parent entity against exposure amount, undrawn amount, and provision amount for that exposure and updates the same.

This is handled in the sub-process **INV_SHAREHOLDING_CALCULATION_STD** of the process Investment **SAMA Investment Data Processing - STD**.

7.1.2.4 Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, the asset class for each exposure is arrived at. Similarly, the application does reclassification for mitigant based on its mitigant types and reclassifies it to standard mitigant types.

Ensure that all products and party type and mitigants which are bank-specific are reclassified, as part of the setup activity. If they are not reclassified, the treatment might not happen as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product types. For Example, Fixed Rate Bond is reclassified as Debt Securities

This is handled in the **Basel Product Type Reclassification** which is part of the **COMMON_RECLASSIFICATION** process.

Party Type Reclassification

Similar to the product type, the customer type (that are stored as counterparty type) are also reclassified as the standard counterparty type. The customer information is expected in the Stage Party Master (STG_PARTY_MASTER), and this also includes the Party Type based on the Stage Party Type Master (STG_PARTY_TYPE_MASTER).

Party type reclassification Rules handle reclassification for customer types. For Example, housing finance company is reclassified as Corporate

This is handled in the **Party Type Reclassification** which is part of **SAMA Other Reclassification** process.

Other Reclassification

As part of the reclassification rules, any other data which is being brought inside the application like seniority, transaction type and so on also get reclassified into OFSAA specific values. This is also

mandatory to be done, as otherwise data will not be available for processing as required by the regulator.

This happens as part of the process **COMMON_RECLASSIFICATION**.

7.1.2.5 Asset Reclassification Rules

Based on Basel product type and standard counterparty type, an asset class is formed by the application. This asset class is used for data processing. The asset class is the same as specified in the accord.

For example, Standard counterparty is Corporate non-SME and Corporate SME, the asset class is corporate. For Basel product type gold, the asset class is Gold.

The asset class for all mitigants is reclassified based on their standard mitigant types and standard issuer type.

This happens in the sub-process **INV_RECLASSIFICATION_STD** of the process **SAMA Investment Data Processing - STD**.

7.1.2.6 Pre-mitigation Calculations

Based on the asset class, the application calculates the Pre-Credit Risk Mitigation (CRM) Exposure at Default (EAD) for each exposure. This value signifies the maximum loss that the bank can suffer, in case of default on this exposure, before considering any mitigation effects.

Some exposures can be hedged against credit risk through various mitigants such as guarantees, collaterals, credit derivatives, and so on. These provide mitigation to credit risk and must be considered while computing Credit RWA, as per the Accord. Hence, the application calculates the pre-mitigation exposure amount and post-mitigation exposure amount.

The application also computes pre-mitigation risk-weighted assets (Pre CRM RWA) and post-mitigation risk-weighted assets (Post CRM RWA) by multiplying the respective EAD by risk weight. The risk weight is arrived at, by considering the credit rating of the exposures and mitigants as per the guidelines.

7.1.2.6.1 Exposure at Default Amount Calculation

Pre CRM EAD

Exposure at Default (EAD) is calculated for all the products. This is being computed using the Exposure Amount (EOP Balance of the Exposure)

This happens in the process **SAMA INV Pre CRM EAD Computation STD** of the process **Investment Data Processing - STD**.

Post CRM EAD

Through the CRM process, the bank considers the effect of the mitigation and calculates the post-mitigation exposure at the default amount. This signifies the maximum loss that the bank can suffer in case of default on this exposure, after considering the effects of the mitigation. This will be the EAD of the Exposure Pre-Mitigation less the covered portion of the mitigant

7.1.2.6.2 Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment processes. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessment are first moved into the table FSI Mutliple Rating Processing (FSI_MULTIPLE_RATING_PROCESSING) wherein the ranking and final selection of which rating to use takes place.

This happens in the sub-process of **INV_MULTIPLE_RATING_ASSESSMENT_DATA_POPULATION,** wherein the data for the multiple assessment processing gets populated into the FSI table. **MULTIPLE_RATING_ASSESSMENT**, wherein the identification of the multiple rating for the exposure happens, and the

INV_MULTIPLE_ASSESSMENT_BASED_RISK_WEIGHT_ASSIGNMENT wherein the actual risk weight and final rating assignment happen for the exposures.

All the above fall under **SAMA Investment Data Processing – STD**.

7.1.2.6.3   Issue Issuer Assessment

For all exposures which remain unrated after the multiple assessment processes, the issue issuer process is performed. This happens in the Issue Issuer Assessment sub-process (**SAMA INV_INV_ISSUE_ISSUER_ASSESSMENT**). In this case, the unrated exposures are assigned a reference rating based on the reference issue available or the rating of the party, whichever is applicable. These unrated exposures are assigned a risk weight based on the reference rating.

For unrated Non-Securitized exposures, the application does an issue-issuer assessment to infer a rating of the unrated exposures, based on the rating of a similar instrument (referred to as reference issue hereafter) issued by the same issuer. The reference issue is used only when it is of the same currency as the exposure and the exposure is senior or equivalent to the same. For the unavailable reference issue, the party rating is used. In the case of the party also being unrated, the exposure remains unrated. Also, the application populates whether the exposure is LT rated or ST rated, based on the rating assigned to the exposure.

7.1.2.6.4   Risk Weight Assignment Rules

Non-Sec Exposures Risk Weight

Risk Weight is assigned based on asset class and the credit rating as per Basel guidelines. The risk weight rules operate on the risk weight table (**FSI_RW_MAP_MASTER**). Highly rated exposures are allocated low-risk weight and poorly rated exposures are allocated high-risk weights.

If exposure has more than one rating (rated by more than one agency), then the final rating is assigned based on multiple assessments. The application updates the risk weights against the exposures directly, when ratings are not considered.

Options for risk-weighting are selected during Run definition if the Run Management UI is used, to update the required calculations as allowed by the specific jurisdiction. For more details on the options, see the Run Management section.

This is handled under the sub-process: **SAMA Investment Risk Weight Assignment - STD** in **SAMA Investment Data Processing – STD** process**.

Funds/ Collective Investment Units

Equity Investments in Funds – (Collective Investment Units (CIU) Processing)

The CIU is funds that have invested in various exposures. The accord has specified various criteria for risk-weighting CIU exposures. The application supports all the approaches. In the case of CIU, the application follows a hierarchy of approaches:

- Look Through Approach

- Mandate Based Approach

- Fall Back Approach

Figure 35: Process flow for Non-Sec Exposures Risk Weight

The exposures to CIU are expected in the table Stage Investments (STG_INVESTMENTS), and the instrument code is expected to be populated for these exposures. The static information related to the instruments is expected in the Instrument contract dimension table (DIM_INSTRUMENT_CONTRACT), and the information about the instruments, which change periodically like the current outstanding issue amount, is expected in the Stage Instrument Contract Detail table (STG_INSTRUMENT_CONTRACT_DTL).

The underlying exposures of CIU are expected in **STG_FUND_CIS_COMPOSITION** with the fund code (instrument code) populated also into Parent Instrument Code.

The underlying composition of the CIU is expected in the table Stage Fund Underlying Composition (**STG_FUND_UNDERLYNG_COMPOSITION**). This has the underlying composition details of the fund, across various products, and the maximum permissible limit of investment in each of the product types, with the fund code as the Instrument ID.

> **NOTE:**
>
> The fund underlying composition and/or the underlying exposures are required for processing, only when the underlying of the fund is not available and when there is mandate information available for the fund.

When the derivatives products are underlying for a CIU, then the MTM value of the derivative is expected to be given as Asset MTM Value (N_ASSET_MTM_VALUE) in Stage Fund CIS Composition (STG_FUND_CIS_COMPOSITION). MTM value of the derivative must also be populated to Composition Value (N_COMPOSITION_VALUE).

> **NOTE:**
>
> Unless the operational criteria are met, the look-through approach is not applicable.

Look Through Approach

The first approach in the hierarchy that the application assigns based on the operational criteria given in the accord is LTA. To validate the operational criteria or conditions given, data is expected as input. Along with the suggested conditions, the application also checks for the availability of the underlying information. If all the sufficient information is available, the application assigns the Look Through Approach (LTA) and computation will be followed as given in the accord. If operational criteria are not met, the application checks for the immediate next approach.

The look-through approach is handled in the sub-process **CIU - INV – Risk Weight Method Assignment – Look Through Approach** in the process **INV_CIU_RISK_WEIGHT_METHOD_CALCULATION**.

Mandate Based Approach

This approach is applied when the information of the underlying and the third-party risk weights that can be used under the look-through approach are not available. To continue with this approach banks, need to have the mandate information required. Once the application checks for the information and assigns the approach, computations for MBA under the Standardized approach are in line with the Basel Accord.

This is handled in the sub-process **CIU - INV – Risk Weight Method Assignment – Mandate Based Approach** in the process **INV_CIU_RISK_WEIGHT_METHOD_CALCULATION**.

Fall Back Approach

If no approach from the hierarchy is applicable based on the checks performed, the application assigns Fall Back Approach. In this approach, all the exposures will be risk-weighted at 1250%.

This is handled in the sub-process **CIU - INV – Risk Weight Method Assignment – Fall Back Approach** in the process **INV_CIU_RISK_WEIGHT_METHOD_CALCULATION**.

Partial use of an approach

A bank may use a combination of the three approaches when determining the capital requirements for an equity investment in an individual fund, provided that the conditions for all the approaches are met.

This will be applicable only in the case of the treatment of funds in other funds, as within a fund the method cannot be different.

Treatment of funds invested in other funds

If the underlying information is available, then the application checks for the approach that is used by the funds. If the approach is not the same across then FBA will be assigned i.e. if the approach used for determining the RW of a fund and the same approach is also where it is invested. Further, if the same then the application carry on with the same approach (Look through or Mandate based approach respectively), if not then we will assign 1250% under Fall Back Approach.

7.1.2.6.5 RWA Calculations

The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight.

This is handled under the sub-process **INV_PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_STD under the process SAMA Investment Data Processing – STD**.

7.1.2.7 Credit Risk Mitigation Process

To calculate the post-CRM RWA, the application needs to account for mitigants that may be in the form of collaterals, guarantees, and credit derivatives. All mitigants are not eligible for RWA computation. All the

mitigants which get populated into the system are being made ineligible, and then the regulatory approved mitigant types and the issuer type combination are made eligible.

7.1.2.7.1   Mitigant Processing

Mitigant Data population

Mitigant data is loaded from the Stage Mitigant table (STG_MITIGANTS) into the FSI CAP Mitigants table (FSI_CAP_MITIGANTS) where further processing takes place. This takes place under the sub-process **Mitigant Data Population** in the process **Mitigant Data Processing.**

Mitigant Multiple Assessment

Similar to exposures with multiple ratings, mitigants with multiple ratings are also subject to Multiple rating Assessments. This is handled under the sub-process **Asset Class Based Mitigant Multiple Rating Assessment** under the process **SAMA Mitigant Data Processing - Standardized.**

7.1.2.7.2   Mitigant Eligibility Approaches and their Risk Weighting Rules

Mitigant Risk Weight

Based on the Asset class of the Mitigant the relevant Risk Weight will be assigned in the sub-process Asset class Based Mitigant Multiple Assessment Risk Weight Assignment in the **SAMA Mitigant Data Processing – Standardized**. Further the application assigns the risk weight to mitigants based on the various asset classes where it assigns the risk weight to selective Mitigant types such as Cash, Cash in process, Equity and Gold (**CAP Mitigant Risk Weight Assignment for Asset Classes - STD**), and for Nettable Liabilities (**CAP Mitigant RW Assignment for Nettable Liabilities**). These fall under the process **Post Crisis Mitigant Risk Weight Assignment** and these are applicable for Simple and Comprehensive approaches.

Under Comprehensive approach, for Mitigant types such as financial collaterals is handled in**CAP Mitigant RW Assignment for Financial Collaterals - Comprehensive Approach** These fall under the process **Post Crisis Mitigant Risk Weight AssignmentMitigant Eligibility**

The application identifies the eligible mitigants based on the criteria as mentioned by the Regulator. The application identifies the following standard mitigants– collateral, guarantees, and credit derivatives.

The application can use the Simple Approach and the Comprehensive Approach for the mitigants which part of the collateral are. The application identifies the eligibility of the financial collateral separately for the simple approach and the comprehensive approach. The eligibility of the collateral mitigants are based on the party type of the mitigant, mitigant types, the credit rating assigned to the mitigant or the party (as applicable), and the classification of collateral as senior or not.

For equity, the eligibility is based on the main index equity and the equity trading status. This is handled in **CAP Collateral Eligibility - Simple Approach - Equity** under the process **PCR Mitigant Eligibility - Simple Approach - ECRA**.

The application identifies the eligibility of the guarantees and credit derivatives based on the party type of the mitigant and the credit rating assigned to the issuer of the mitigant. This is handled in **CAP Mitigant Eligibility - Based on Rating for Mitigant Covering Securitization Transactions - ECRA** under the process **PCR Mitigant Eligibility - Simple Approach - ECRA**

Similar mitigant eligibility rules for Comprehensive Rule can be found in the **process PCR Mitigant Eligibility - Comprehensive Approach - ECRA**

The option for the bank to select Collateral Simple Approach or Comprehensive Approach is based on the Run Management option as selected in the UI.

7.1.2.7.3 Mitigant Haircut Assignment

In the Standardized approach, the bank must follow supervisory estimates for Mitigant Haircut assignment. This is based on various categories such as mitigant type, residual maturity, rating, issuer type, and so on. This is applicable only if the bank follows the Comprehensive approach for collateral.

Eligible mitigants are only considered for haircut assignment and further processing. Post haircut assignment, the eligible mitigants are moved from the mitigants table (FSI_CAP_MITIGANTS) to the sub-exposures table (FSI_CAP_SUB_EXPOSURES).

The application performs computations for three kinds of mitigant haircuts which are volatility haircut, FOREX haircut, and maturity mismatch haircut.

Volatility Haircut

Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. The application assign haircuts for various type of financial collateral like debt securities, equity, mutual funds, and so on. In the supervisory haircut method, the application assigns volatility haircuts based on issues, issuer's ratings, mitigant's residual maturity, and type of mitigant.

This is handled in the following sub-processes:

- CRM Mitigant Volatility Haircut for Collateral - Supervisory Haircut

- CRM Mitigant Volatility Haircut for Cash and Gold - Supervisory Haircut

- SAMA - CAP CRM Mitigant Volatility Haircut for Equity - Supervisory Haircut

- CAP CRM Underlying Mitigant Volatility Haircut Assignment

- CAP CRM Mitigant Volatility Haircut for Mutual Fund - Supervisory Haircut

These sub-processes are part of the process **Mitigant Haircut Assignment - Comprehensive Approach**.

Forex Haircut

If the exposure and collateral are in different currencies, then the application adjusts by applying the FOREX haircut.

This is handled in the sub-process **CAP CRM Forex Haircut** in the process **CRM Sub Exposure Data Haircut Assignment**.

Maturity Mismatch Haircut

If the residual maturity of the Credit Risk Mitigant is less than that of the underlying credit exposure, then a maturity mismatch haircut is applied to adjust the value.

This is handled in the sub-process **CAP CRM Maturity Mismatch Haircut** of the process **CRM Sub Exposure Data Haircut Assignment**.

7.2 Counterparty Credit RWA

Counterparty Credit RWA is the calculation of the counterparty credit risk exposures. This includes the derivative portfolio and the Securities and Financing transaction portfolio. This also includes the exposures in both banking book and trading book.

The counterparty credit exposures also undergo additional RWA calculation in the form of Credit Valuation Adjustment (CVA). The mark to market counterparty credit losses or the spread migration risk is captured with CVA, which was not directly capitalized before. CVA is the difference between the risk-free portfolio value and the true portfolio value that considers the possibility of the counterparty's default. In other words, CVA is the market value of counterparty credit risk.

7.2.1 Derivatives Portfolio

Figure 36: Process Flow for Derivatives Portfolio
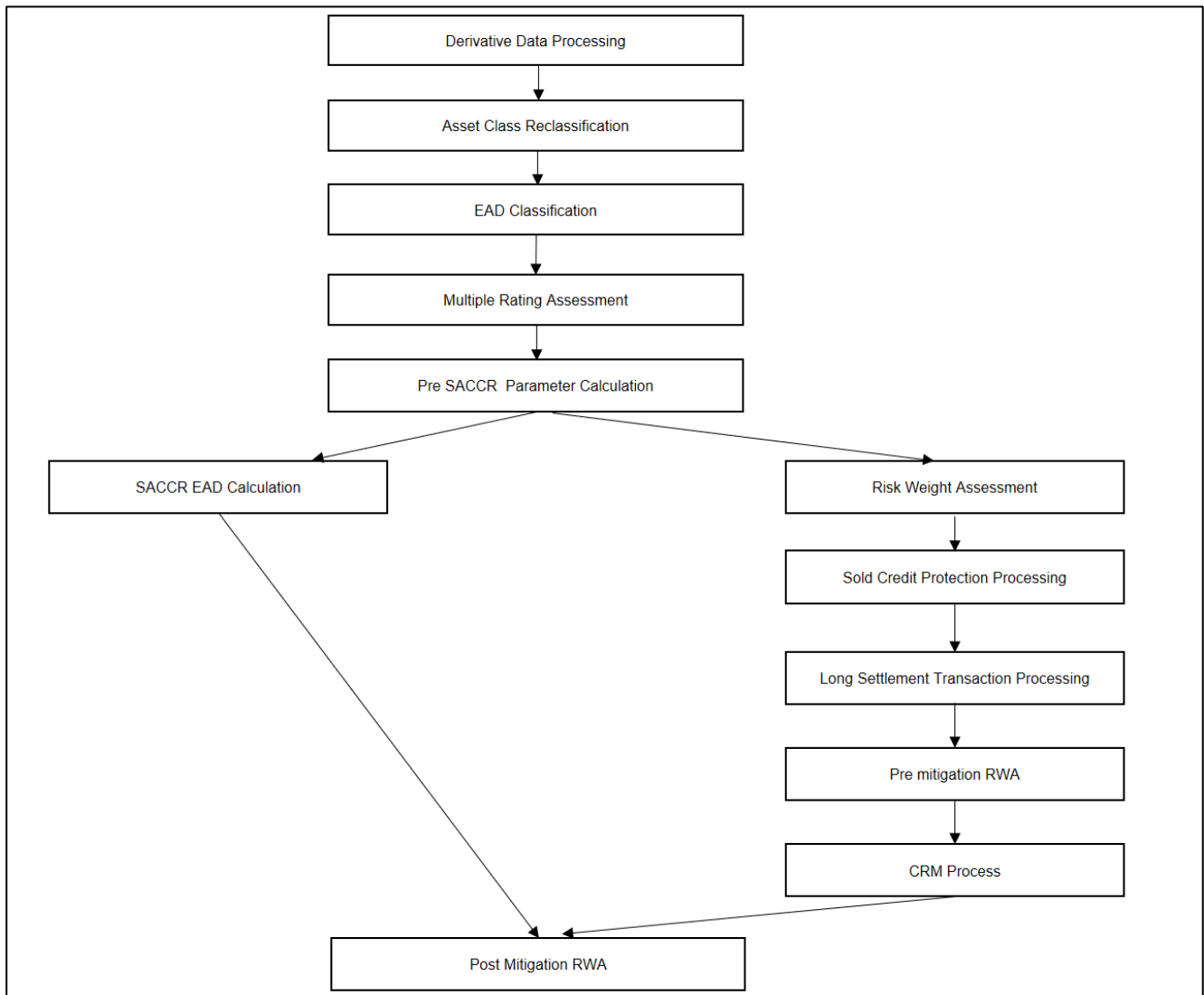
7.2.1.1 Rating Population

The Data on ratings is captured in the following rating specific tables:

- Party Rating Table (**STG_PARTY_RATING_DETAILS**)
  - Credit rating for all are captured in this table.

- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)

  - Credit Rating for all countries is captured in this table.

  - Instrument Rating Table (**STG_INSTRUMENT_RATING_DETAILS**)

Ratings for all instruments are captured in this table. Even the posted collateral (Placed Collateral) and received collateral (Mitigants) related ratings are captured in this table, and this is handled in the process **INSTRUMENT_RATINGS_POPULATION**. This happens in the Credit Rating Data Population process in the SAMA common data processing

7.2.1.1.1 Processing Steps

Banks obtain credit ratings from different sources and these are provided as input in the application through the rating tables mentioned in the preceding list.

This is handled in the process **RATING_RECLASSIFICATION_POPULATION.**

The application re-classifies the rating information to BIS Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short-Term ratings.

This is handled in the process **Credit Rating Reclassification**.

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables.

Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

You must ensure that all the relevant columns as indicated in the DL Specs are populated with data. For example, in the Stage Party Rating Details (**STG_PARTY_RATING_DETAILS)** table: Rating source code (**V_RATING_SRC_CODE**), Party Code (**V_PARTY_CD**), Purpose (**V_PURPOSE**) are required to be populated. The purpose code indicates whether the rating is a domestic rating or a foreign rating. If any other rating is provided, then the exposure is considered unrated.

7.2.1.2 Data Population

The following are the preprocessing steps:

Credit Risk exposures are updated in the application for all the product types through their respective input tables known as Product Processors. The main categories of Counterparty Credit Risk exposures, along with their respective table names that are used as an input, are as follows:

Table 12: Counterparty Credit Risk Exposures

Product	Source Product Processor
Swaps	STG_SWAPS_CONTRACTS
Futures	STG_FUTURES
Options	STG_OPTION_CONTRACTS
Credit Derivatives	STG_CREDIT_DERIVATIVES
Forwards	STG_FORWARDS

There is a data population about the placed collateral and central counterparty details that are required for the cleared transaction and default fund contribution treatment.

Table 13: Data Population for Placed Collateral and Central Counterparty Details

Product	Source Product Processor
Placed Collateral	STG_PLACED_COLLATERAL
Default Fund Contribution	STG_CCP_DETAILS

There is a data population for mitigants that adheres to the applicable mitigant type such as collateral received for the derivatives.

Table 14: Data Population for Mitigants

Product	Source Product Processor
Mitigants – Collateral received	STG_MITIGANTS

There are data populations for the mapping between the exposures and the mitigants and the mapping between exposures and placed collateral.

Table 15: Data Population for Mapping between Exposures and Mitigants

Product	Source Table
Mapping for Exposures and Mitigants	STG_ACCOUNT_MITIGANT_MAP
Mapping for Exposures and Placed Collateral	STG_ACCT_PLACED_COLL_MAP

Processing table details

All Counterparty credit Risk related derivative exposures are loaded into the table FSI Cap Derivative (**FSI_CAP_DERIVATIVES)** where further processing occurs for this portfolio of exposures until they are moved to the Netting set granularity. This is handled in the process **Derivative Data Population** process in the following sub-processes;

- DERIVATIVE_SWAPS_EXPOSURE_DATA_POPULATION

- DERIVATIVE_FUT_EXPOSURE_DATA_POPULATION

- DERIVATIVE_OPT_EXPOSURE_DATA_POPULATION

- DERIVATIVE_FORWARDS_EXPOSURE_DATA_POPULATION

- DERIVATIVE_CREDIT_DERIVATIVES_DATA_POPULATION

All placed collateral that the bank has placed that are not specific to Securities Financing Transactions exposures are loaded into the table **FSI_ PLACED_COLLATERAL**.

All the collateral that the bank has received as part of the Derivative transactions are loaded into the table **FSI_CAP_MITIGANTS**.

7.2.1.3 Shareholding Percent Multiplication

Shareholding percent multiplication for common entity-level data is a part of the **SAMA Common Data Processing** (PMFSAM002) process. In this process, the application updates the shareholding percentage against each entity. The parent entity is updated with the value of 1 as the shareholding percent, and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PERCENT).

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity concerning parent entity against exposure amount, undrawn amount, and provision amount for that exposure and updates the same.

This is handled in the sub-process Derivative Shareholding Calculation (**DRV_SHAREHOLDING_CALCULATION_STD)** of the process **SAMA Derivative Data Processing – STD**.

7.2.1.4 Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, the asset class for each exposure has arrived. Similarly, the application performs reclassification for mitigants based on the mitigant type and reclassifies it to standard mitigant types.

Ensure that all products, party types, and mitigants that are bank-specific are reclassified as part of the setup activity. If they are not reclassified, the treatment does not happen as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product types. For Example, Interest Rate Futures is reclassified as Futures

This is handled in the OFSAA - **Basel Product Type Classification** which is part of the Common Reclassification (COMMON_RECLASSIFICATION) process.

Party Type Reclassification

Similar to the product type, the customer type (which is stored as counterparty type) is also reclassified as the standard counterparty type. The customer information is expected in the Stage Party Master (STG_PARTY_MASTER). This also includes the Party Type based on the Stage Party Type Master (STG_PARTY_TYPE_MASTER).

Party type reclassification Rules handle reclassification for customer types. For Example, a Small business entity is reclassified as a Corporate SME

This is handled in the Basel **Party Type Reclassification** which is part of the SAMA Other Reclassification process.

Instrument Type Reclassification

Bank Instrument types used by the reporting bank as input data are reclassified to Instrument types. The instrument types after reclassification are stored as Instrument types. For Example, Interest Rate Future Contract is reclassified as Interest Rate Futures. This happens as part of the process COMMON_RECLASSIFICATION process.

Mitigant Reclassification

For mitigants, the application reclassifies the mitigant type to the standard mitigant type like the debt securities.

The reclassification tasks are present in the Common Reclassification (COMMON_RECLASSIFICATION) process.

7.2.1.5   Pre-mitigation Calculations - Exposure at Default Amount Calculation

Pre-mitigation Exposure at Default can be calculated using one of the two approaches of EAD – SA CCR and IMM methods. This is based on run management selection.

The Standardized Approach for Counterparty Credit Risk (SA-CCR) is an alternative for Standardized Method (SM) and Current Exposure Method (CEM) for Counterparty Credit Risk (CCR) in Credit Risk.

Banks can use the SA-CCR approach while they follow Standardized or IRB approaches for credit risk. The SA-CCR approach is applicable for Over the Counter (OTC) Derivatives, Exchange Traded Derivatives, and Long Settlement Transactions.

7.2.1.5.1   SA-CCR Method of EAD Computation

The exposures under the SA-CCR consist of two components: Replacement Cost (RC) and Potential Future exposure (PFE). The replacement cost is mostly related to the mark to market of the derivative contract, by considering the collateral and margin agreement as relevant. The potential future exposure consists of a multiplier that allows for the partial recognition of excess collateral and an aggregate add-on.

The following flowchart depicts the process flow of SA-CCR.

Figure 37: Process Flow of SA-CCR
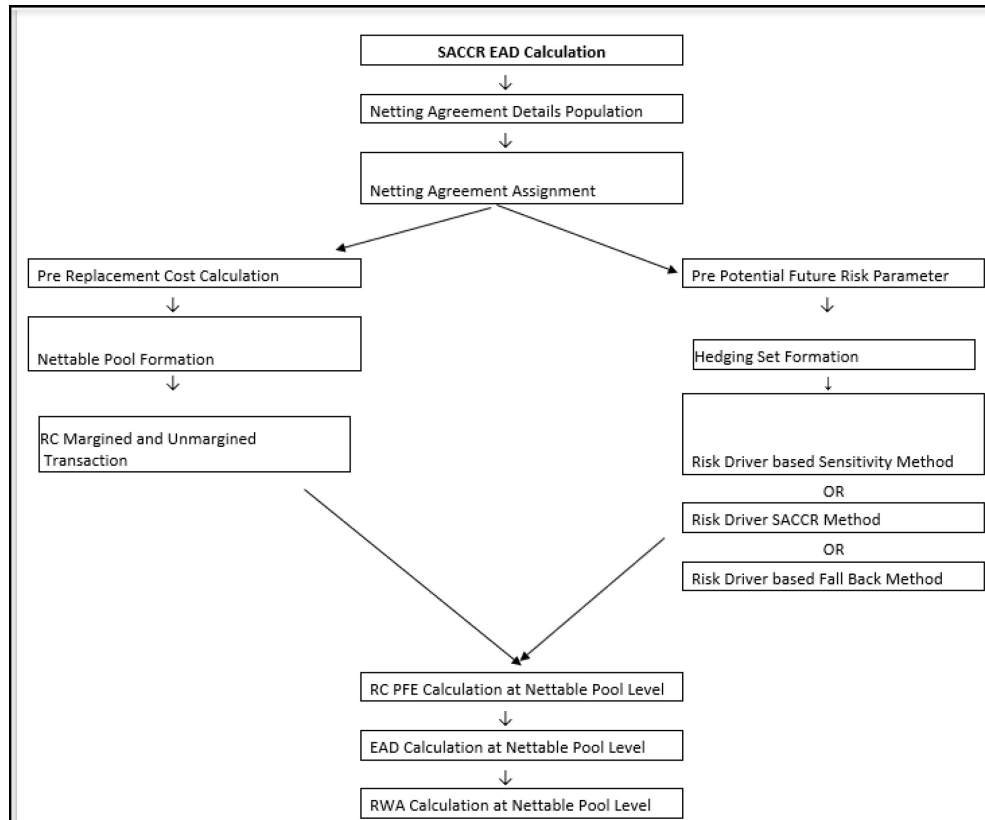
Netting Agreement

For instruments participating in the netting set, the notability flag should be set as 'Y'. Instruments with the same agreement code are netted in the same netting set.

The application creates new records for the netting agreement and then populates them into the FSI Netting Agreement Details (FSI_NETTING_AGREEMENT_DETAILS) table. The netting agreements are populated in the process NETTING_AGREEMENT_DETAILS_DATA_POP.

Margin Agreement

For both RC and PFE, if one of the netting agreements has multiple margin agreements, then this netting agreement should be divided into sub-netting agreements to align with the margin agreements. This is captured in RC_MARGINED_UNMARGINED_AGREEMENT process Placed Collateral & Mitigant – Eligibility Condition

The mitigant is identified as eligible are not based on the eligibility rules for CRM as mentioned in the Basel III accord. Credit rating of the collateral is considered for all mitigants types issued by all party types while deciding whether a mitigant is eligible for a particular exposure or not. Separate eligibility Rules exist for mitigants types like equity, or debt security, to perform these checks. For the remaining, a mitigant is marked as eligible only if its credit rating is better than the exposure to which it is providing protection and also if it is classified as senior in position. This is handled in the sub-process - **SAMA Mitigant Data Processing - Standardized** (FSI_CAP_MITIGANTS).

Mitigant eligibility is also checked based on the original and residual maturity of the collateral. Collateral is classified as eligible only if its original maturity is more than a year and residual maturity is more than 3 months.

The placed collateral is captured in FSI Cap Placed Collateral (FSI_CAP_PLACED_COLLATERAL) and this also moves to FSI Cap Mitigants (FSI_CAP_MITIGANTS), wherein the placed collateral and the mitigants both undergo the same treatment. This is part of the process   Derivatives Data Population and for Mitigants the data is populated via Mitigant Data Population in the process **SAMA Common Data Processing**.

Placed Collateral & Mitigant – Haircut Assignment

The application assigns three kinds of mitigant haircuts: volatility haircut, FOREX haircut, and maturity mismatch haircut. Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. Separate Rules exist in the application for various types of financial collaterals such as debt securities, equity, mutual funds, and so on. When the exposure and collateral are in different currencies, the application adjusts by applying FOREX haircut. If the residual maturity of CRM is less than the underlying credit exposure, then a maturity mismatch is applied. If there is a maturity mismatch and CRM has an original maturity of more than a year, the maturity mismatch haircut is applied to adjust the value. The application assigns a volatility haircut using the Supervisory Haircut method when the standardized approach is selected.

This is part of the process SAMA Mitigant Data Processing and SAMA CRM Data Processing

Replacement Cost

Methods of identifying various risk categories and risk drivers

For each exposure, the banks must identify the primary risk driver of the risk factors such as interest rate, foreign exchange, credit, equity, or commodity. This is crucial because the Add-on formula for each risk category is different and it depends on the nature of the risk factors. The risk categories can be identified by defining the primary risk factors of underlying exposures in the derivative contracts.

This is selected by the bank based on the Run Management UI.

- Sensitivities Based Method

- SA-CCR Based Method

  o All the Add-ons are computed for the instrument concerning all material risk drivers as per the SA CCR calculation. Using this, the material risk categories are identified, like the ones with the maximum absolute value of sensitivity multiplied by the risk weight. This gets handled in the process and the table.

- Fall Back Approach

  o All the Add-ons are computed for the instrument concerning all risk drivers. And all the risk categories will be considered as the material risk driver. This gets handled in the process and the table.

  Essentially, it will be one instrument that can be mapped to multiple risk categories, with one material risk driver identified for each risk category. The resultant replacement cost is a summation of the add-on across all the material risk categories.

  The data for Risk Drivers and Categories are from the following tables:

  o FSI Cap Risk Category Master (FSI_CAP_RISK_CATEGORY_MASTER)

  o FSI Cap Risk Driver Master (FSI_CAP_RISK_DRIVER_MASTER)

  o FSI Cap Risk Driver Map Master (FSI_CAP_RISK_DRIVER_MAP_MASTER)

o Parameter Calculations for Potential Future Exposure

The parameters to be considered for the Calculation of Potential Future Exposure are treated under the process PRE_POTENTIAL_FUTURE_RISK_PARAMETERS.

Multiplier

The multiplier in the PFE formula serves to reduce the add-on for over-collateralization as in practice many banks hold excess collateral precisely to offset potential increases in exposure represented by the add-on.

Aggregate Add-on

The asset classes; interest rate, foreign exchange, credit, equity, or commodity, and a derivatives transaction are assigned to an asset class based on its primary risk driver. The add-ons for each asset class are simply aggregated.

Most derivative transactions have one primary risk driver, defined by its reference to the underlying instrument.

Adjusted Notional

For interest-rate and credit derivatives, the trade-level adjusted notional is the product of the trade notional amount, converted to the domestic currency, and the supervisory duration (SD).

Supervisory delta adjustments

These parameters are also defined at the trade level and are applied to the adjusted notional amounts to reflect the direction of the transaction. For derivatives that are not options, the value of this parameter is +1 for long (MTM increases when the value of the primary risk factor increases) or -1 for short (MTM decreases when the value of the primary risk factor increases).

Supervisory correlation parameters

These parameters apply only to the PFE add-on calculation for equity, credit, and commodity derivatives. For these asset classes, the supervisory correlation parameters are derived from a single-factor model and specify the weight between systematic, and idiosyncratic components.

Potential Future Exposure (PFE)

The Potential Future Exposure (PFE) is computed differently for each of the risk categories, and the final value is assigned to the netting set (stored at the FSI Cap Nettable Pool (FSI_CAP_NETTABLE_POOL).

PFE add-ons are calculated for each asset class within a netting set and then aggregated. Add-ons for an asset class require the use of hedging sets that are transactions within a single netting set within which partial or full offsetting is recognized in the methodology.

For Interest rate derivatives, hedging set consists of all derivatives. Hedging sets are further divided into maturity categories. Long and short positions in the same hedging set are permitted to fully offset each other within maturity categories. Across maturity categories, partial offset is recognized.

For the calculation of PFE, it is required to adopt the unmargined methodology. This is due to the fact that one margin agreement applies to multiple netting agreements and collaterals are based on the netted MTM values of the derivative contracts.

This is handled in **FSI_POTENTIAL_FUTURE_EXP_CALC**.

Exposure at Default Calculations (EAD)

Through the CRM process, the bank takes into account the mitigation effect and calculates the post-mitigation exposure at the default amount. This signifies the maximum loss that the bank can suffer in case of default on this exposure after considering all the mitigation effects. The application also computes pre-mitigation risk-weighted assets in the process **DRV_PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION** and post-mitigation risk-weighted assets in the process **DRV_POST_CRM_RISK_WEIGHTED_ASSET_CALCULATION** by multiplying the respective EAD by risk weight. The risk weight is arrived at by analyzing the credit rating of the exposures or mitigants.

The risk weight is arrived at by multiplying the pre-mitigation capital charge by 12.5. Through Credit Risk Mitigation, the bank considers the effects of mitigation. The application checks mitigant eligibility based on the Basel specifications and assigns a haircut to each mitigant based on their currency, residual maturity, and expected volatility in their market value.

7.2.1.6   Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment processes. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessments are first moved into the table FSI Multiple Rating Processing (**FSI_MULTIPLE_RATING_PROCESSING**) wherein the ranking and final selection of which rating to use takes place.

This happens in the sub-process of **DRV_MULTIPLE_ASSESSMENT_PROCESSING_DATA_POP.** The data for the multiple assessment processing gets populated into the FSI table **MULTIPLE_RATING_ASSESSMENT** where the identification of the multiple rating for the exposure occurs. In **DRV_MULTIPLE_ASSESSMENT_BASED_RISK_WEIGHT_ASSIGNMENT**, the actual risk weight and final rating assignment happen for the exposures.

7.2.1.7   Issue Issuer Assessment

For all the exposures which remain unrated after the multiple assessment processes, the issue issuer process is performed. This happens in the Issue Issuer Assessment sub-process SAMA DRV Issue Issuer Assessment. In this case, the unrated exposures are assigned a reference rating based on the reference issue available or the rating of the party, whichever is applicable. These unrated exposures are assigned a risk weight based on the reference rating.

For Derivatives, the application does an issue-issuer assessment to infer a rating of the unrated exposures, based on the rating of a similar instrument (referred to as reference issue hereafter) issued by the same issuer. The reference issue is used only when it is of the same currency as the exposure and the exposure is senior or equivalent to the same. For the unavailable reference issue, the party rating is used. In the case of the party also being unrated, the exposure remains unrated. Also, the application populates whether the exposure is LT rated or ST rated, based on the rating assigned to the exposure.

7.2.1.8   Risk Weight Assignment Rules

Risk Weight Assignment to all Exposures

Risk Weight is assigned based on asset class and the credit rating as per Basel guidelines. The risk weight rules operate on the risk weight table (**FSI_RW_MAP_MASTER**). Highly rated exposures are

allocated low-risk weight and poorly rated exposures are allocated high-risk weights. If exposure has more than one rating (rated by more than one agency), then the final rating is assigned based on multiple assessments. The application updates the risk weights against the exposures directly when ratings are not considered.

Options for risk-weighting are selected during Run definition if the Run Management UI is used to update the required calculations as allowed by the specific jurisdiction. For more details on the options, see the Run Management section.

Figure 38: Risk Weight Assessment
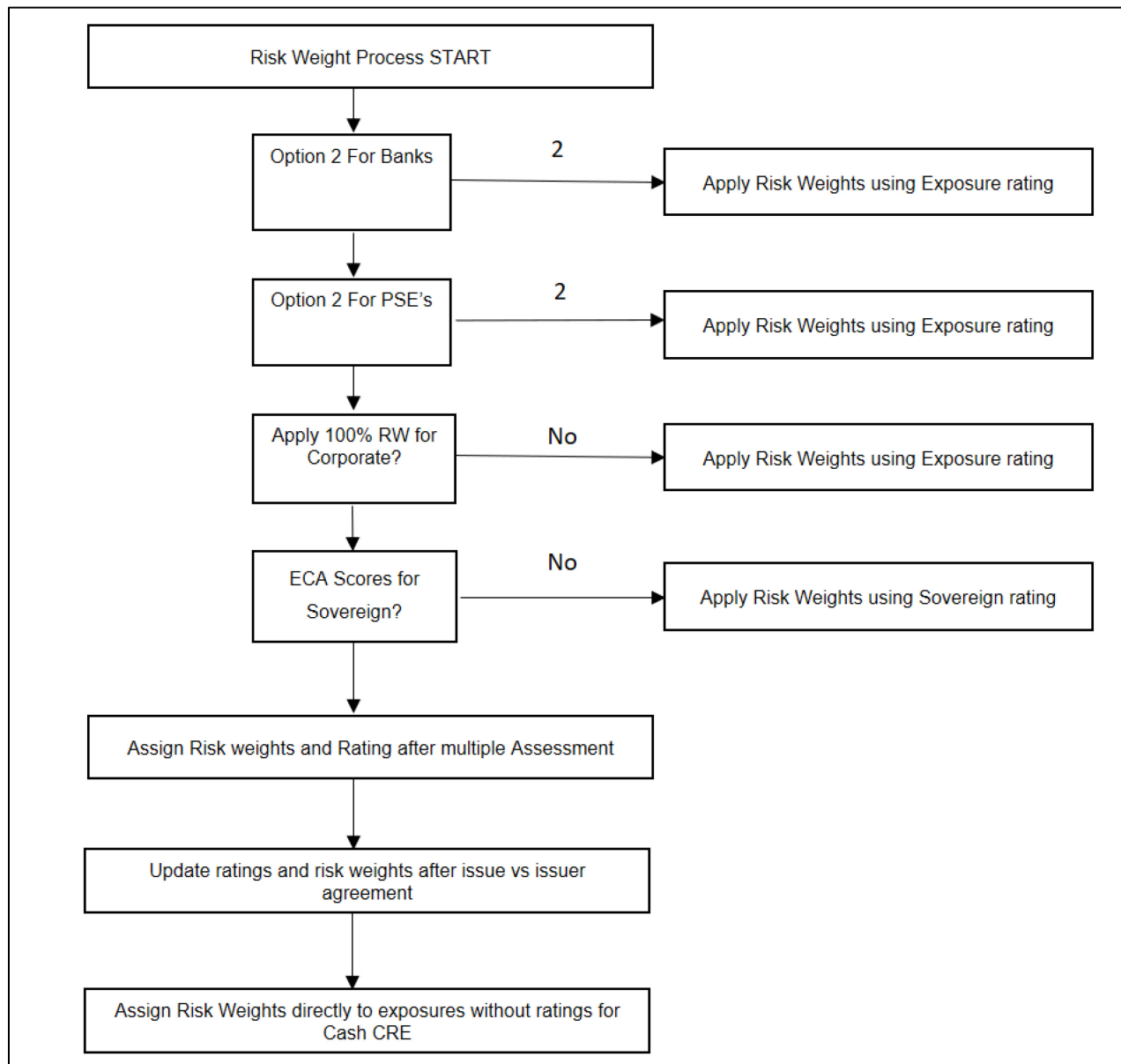
Risk weight assignment takes place in the sub-process **SAMA Derivative Risk Weight Assignment – STD**.

Risk Weight Assignment to Sold Credit Protection Exposures

The sold credit protection data is specific to sold credit derivatives. This data is available in the product processor table STG_CREDIT_DERIVATIVES. The sold credit protection data is processed in **SOLD_CREDIT_PROTECTION _DATA_PROCESSING.** The underlying data are required for all the sold credit protection.

The risk weight assignment for the sold credit protection is based on the asset type of the underlying exposure captured in **Non-Sec Pre-Mitigation RW Assignment for Rated SCP – STD.**

- The risk weight for the underlying exposure is calculated and this is updated to the sold credit protection exposure in the sub process **Derivative Pre-Mitigation RW UL for SCP based on Revised Sec Framework**

- The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight

- Fo sold credit protection exposures, the Pre-Mitigation EAD, and the Post Mitigation EAD are the same since there are no mitigants for these exposures.

The underlying data for sold credit protection data is provided in the STG_UNDERLYING_EXPOSURES table. The underlying for the sold credit protection has V_UNDERLYING_DATA_IDENTIFIER where the underlying of the sold credit protection has "V_UNDERLYING_DATA_IDENTIFIER" as "SCP" to recognize this for the Sold credit protection treatment captured in sub process Derivative_SCP_underlying.

Risk Weight Assignment to Cleared Transaction Exposures

When a bank acts as a clearing member of a CCP for its purposes, a risk weight of 2% must be applied to the bank's trade exposure to the CCP in respect of OTC derivatives, exchange-traded derivative transactions, and SFTs. When the clearing member offers clearing services to clients, the 2% risk weight also applies to the clearing member's trade exposure to the CCP that arises when the clearing member is obligated to reimburse the client for any losses suffered due to changes in the value of its transactions if the CCP defaults. This is captured in the sub-process **SAMA Derivative Risk Weight Assignment – STD**.

Risk Weight Assignment to Specific Wrong Way Risk Exposures

Specific Wrong-way risk is defined as the risk that occurs when exposure to a counterparty is adversely correlated with the credit quality of that counterparty. It arises when default risk and credit exposure increase together. For all the transactions which are identified as Specific wrong-way risk, Risk weight is assigned in sub-process SAMA Derivative Risk Weight Assignment - STD.

7.2.1.9 RWA Calculations

The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight.

In the case of sold credit protection exposures, the Pre-Mitigation EAD and the Post-mitigation EAD is the same since there are no mitigants for these exposures.

7.2.1.10 Post CRM RWA Calculations

In the case of derivatives, there are no additional mitigants, and hence both pre-CRM RWA calculations and post CRM RWA calculations are the same.

7.2.1.11   Allocation of RWA at Exposures

CCR RWA calculated at the netting set level is allocated to the exposures of the nettable pool using the following formula:

RWA at Exposure Level = Total CCR RWA at netting set level * Pre-Mitigation EAD for Exposure / Sum of Pre-Mitigation EAD for all Exposures part of CCR RWA at netting set level

7.2.2   Securities Financing Transactions Portfolio

Securities Financing Transactions (SFT) include Repo Style transactions, Margin Lending, Security Financing Borrowing, and so on. In the Standardized method, there are two approaches.

- **Simple approach** – Collateral is substituted for the covered portion of the exposure, and the risk weights as applicable for the standard mitigant type and issuer type are assigned to the collateral.

- **Comprehensive approach** – Collateral undergoes haircut treatment and the exposure value gets reduced from this portion

For all SFT contracts which have a placed collateral or mitigant mapped to it, the application computes CRM based on the RWA approach undertaken by the bank.

Process Flow for Credit Risk Securities Financing Transactions

Figure 39: Process Flow for Credit Risk Securities Financing Transactions
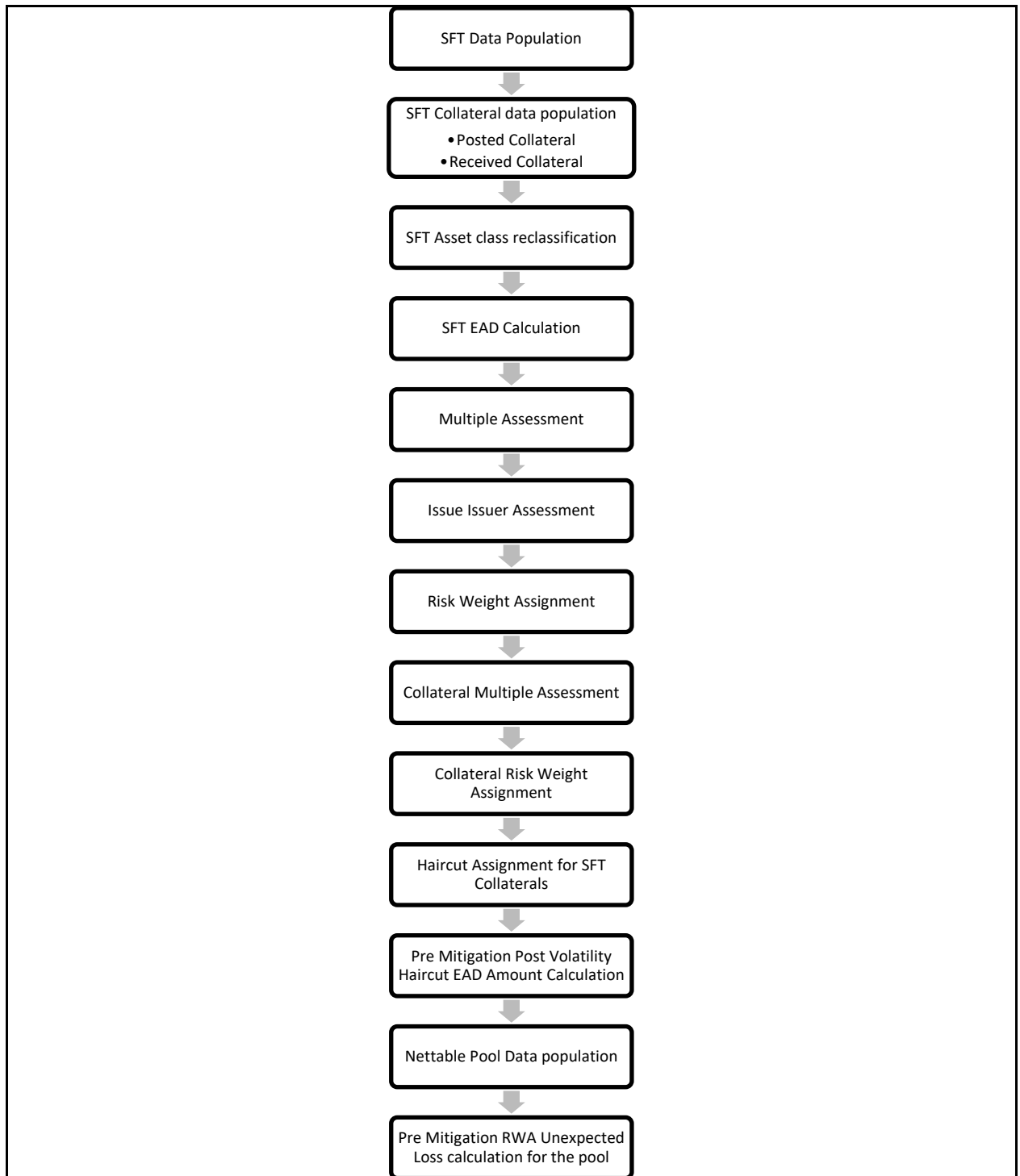
7.2.2.1 Rating Population

The data on ratings is captured in the following rating specific tables:

- Party Rating Table (**STG_PARTY_RATING_DETAILS**)

- Credit Rating for all customers and issuers are captured in this table.

- Instrument Rating Table (STG_INSTRUMENT_RATING_DETAILS)

  - Credit Rating for all instruments which are in the form of collateral either placed or received are captured in this table.

- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)

  - Credit Rating for all countries is captured in this table.

7.2.2.1.1 Processing Steps

Banks obtain credit ratings from different sources and these are provided as input in the application through the rating tables mentioned in the preceding list.

This is handled in the process **RATING_RECLASSIFICATION_POPULATION.**

The application re-classifies the rating information to BIS Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short-Term ratings.

This is handled in the process **Credit Rating Reclassification**.

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables.

Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

You must ensure that all the relevant columns as indicated in the DL Specs are populated with data. For example, in the Stage Party Rating Details (**STG_PARTY_RATING_DETAILS)** table: Rating source code (**V_RATING_SRC_CODE**), Party Code (**V_PARTY_CD**), Purpose (**V_PURPOSE**) are required to be populated. The purpose code is to indicate whether the rating is a domestic rating or a foreign rating. If any other rating is provided, then the exposure is considered unrated.

7.2.2.2 Data Population

Credit Risk exposures are updated in the application for all the product types through their respective input tables known as Product Processors. Main categories of Counterparty Credit Risk exposures, along with their respective table names that are used as an input, are as follows:

Table 16: Data Population for Counterparty Credit Risk Exposures

Product	Source Product Processor
Margin Lending Transactions	STG_LOAN_CONTRACTS
Re purchase contracts	STG_REPO_CONTRACTS

There is a data population about the placed collateral that has been placed concerning the SFT transaction.

Table 17: Data Population for Placed Collateral

Product	Source Product Processor
Placed Collateral	STG_PLACED_COLLATERAL

There is a data population about the mitigants that adheres to the mitigants that have been received concerning the SFT transaction.

Table 18: Data Population for Mitigants

Product	Source Product Processor
Mitigants – Collateral Received	STG_MITIGANTS

There is a data population for the mapping between the following:

- Exposures and mitigants

- Exposures and placed collateral

Table 19: Data Population for Mapping

Product	Source Table
Mapping for Exposures and Mitigants	STG_ACCOUNT_MITIGANT_MAP
Mapping for Exposures and Placed Collateral	STG_ACCT_PLACED_COLL_MAP

Processing table details

All Counterparty Credit Risk SFT exposures are loaded into the table, FSI Cap SFT Exposures (**FSI_CAP_SFT_EXPOSURES)** where further processing happens for this portfolio of exposures.

This is handled in the process SFT Data Population (**SFT_DATA_POPULATION)**.

7.2.2.3 Shareholding Percent Multiplication

Shareholding percent multiplication for common entity-level data is a part of the **SAMA Common Data Processing** (PMFSAM002) process. In this process, the application updates the shareholding percentage against each entity. The parent entity is updated with the value of 1 as the shareholding percent and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PCT).

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity concerning parent entity against exposure amount, undrawn amount, and provision amount for that exposure and updates the same.

This process is handled in the sub-process SFT Shareholding Calculation (SFT_SHAREHOLDING_CALCULATION_STD) of the process SAMA SFT Data Processing-STD.

7.2.2.4 Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, the asset class for each exposure is determined. Similarly,

the application performs the reclassification for mitigant based on its mitigant types and reclassifies it to standard mitigant types.

You must ensure that all products, party types, and mitigants that are bank-specific are reclassified as part of the setup activity. If they are not reclassified, the treatment may not occur as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product types. For Example, any security lending product is reclassified as Security lending and borrowing product type.

This is handled in the **OFSAA-Basel Product Type Classification** which is part of the Common Reclassification (COMMON_RECLASSIFICATION) process.

Party Type Reclassification

Similar to the product type, the customer type (that is stored as counterparty type) is also reclassified as the standard counterparty type. The customer information is expected in the Stage Party Master (**STG_PARTY_MASTER**) and this also includes the **Party Type** based on the Stage Party Type Master (**STG_PARTY_TYPE_MASTER**).

Party type reclassification Rules handle reclassification for customer types. For Example, any central bank is reclassified as Sovereign.

This is handled in the Basel **Party Type Reclassification** which is part of the SAMA Other Reclassification process.

Mitigant Reclassification

For mitigants, the application reclassifies the mitigant type to the standard mitigant type such as debt securities, cash, and so on.

The reclassification tasks are present in the Common Reclassification (COMMON_RECLASSIFICATION) process.

Other Reclassification

As part of the reclassification rules, any other data which is being brought inside the application like seniority, transaction type, and so on also get reclassified into OFSAA specific values. You must also perform this activity as data may not be available for processing as required by the regulator.

This happens as part of the process Common Reclassification (**COMMON_RECLASSIFICATION**).

7.2.2.5 Asset Reclassification Rules

Based on Basel product type and standard counterparty type, an asset class is formed by the application. This asset class is used for data processing. The asset class is the same as specified in the accord.

For example, for Standard counterparty is Corporate non-SME and Corporate SME, the asset class is corporate.

The asset class for all mitigants is reclassified based on their standard mitigant types and standard issuer type.

This occurs in the sub-process **SFT Reclassification - STD** and in the process **SAMA SFT Data processing – STD**.

7.2.2.6   Pre-mitigation Calculations

Based on the asset class, the application calculates the Pre-Credit Risk Mitigation (CRM) Exposure at Default (EAD) for each exposure. This value signifies the maximum loss that the bank can suffer if there is a default on this exposure before considering any mitigation effects.

In the case of SFT Exposures, the exposures are hedged against credit risk through various collateral. These collaterals provide mitigation to credit risk and must be considered while computing Credit RWA as per the Accord. Hence, the application calculates the pre-mitigation exposure amount and post-mitigation exposure amount.

The application also computes pre-mitigation risk-weighted assets (Pre CRM RWA) and post-mitigation risk-weighted assets (Post CRM RWA) by multiplying the respective EAD by risk weight. The risk weight is determined by considering the credit rating of the exposures and mitigants as per the guidelines.

7.2.2.6.1   Exposure at Default Amount Calculation

Pre-mitigation Exposure at Default can be calculated using one of the two approaches of EAD: Simple Approach and Comprehensive Approach. This is based on the run management selection.

- **Calculation of EAD – Comprehensive Approach**

  As per the Comprehensive Approach, the EAD is computed by considering the Exposure amount post haircut and the collateral amount post haircut.

  - Exposure Amount Calculations for the Exposures

    The exposure amount from the product processor tables **STG_REPO_CONTRACTS** and **STG_LOAN_CONTRACTS** for the respective products are based on their EOP balance which is the End of period balance that is populated into the processing table (**FSI_CAP_SFT_EXPOSURES**) for further calculations.

  This is part of the process **SFT Data Population**.

- **Placed Collateral & Mitigant – Eligibility**

  The mitigant is identified as eligible are not based on the eligibility rules for CRM as mentioned in the Basel III accord. Credit rating of the collateral is considered for all mitigants types issued by all party types while deciding whether a mitigant is eligible for a particular exposure or not. Separate eligibility Rules exist for mitigants types such as equity or debt security to perform these checks. For the remaining, a mitigant is marked as eligible only if its credit rating is better than the exposure to which it is providing protection and also if it is classified as senior in position.

  This is handled in the sub-process - SAMA Mitigant Data Processing - Standardized (FSI_CAP_MITIGANTS). Mitigant eligibility is also checked based on the original and residual maturity of the collateral. Collateral is classified as eligible only if its original maturity is more than a year and residual maturity is more than 3 months.

  The placed collateral is captured in FSI Cap Placed Collateral (FSI_CAP_PLACED_COLLATERAL) and this also moves to FSI Cap Mitigants (FSI_CAP_MITIGANTS), wherein the placed collateral and the mitigants both undergo the same treatment.

  This is part of the sub-process **SAMA Mitigant Data Processing - Standardized** in the process **SAMA SFT Placed Collateral Data Processing - STD**.

- ▪ **Placed Collateral & Mitigant – Haircut Assignment**

  The application assigns three kinds of mitigant haircut, which are volatility haircut, FOREX haircut, and maturity mismatch haircut.

  Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. Separate Rules exist in the application for various types of financial collaterals like debt securities, equity, mutual funds, and so on. The application assigns a volatility haircut using Supervisory Haircut method when standardized approach is selected.

  When the exposure and collateral are in different currencies, the application makes an adjustment by applying FOREX haircut.

  If the residual maturity of CRM is less than the underlying credit exposure, then a maturity mismatch is applied. If there is a maturity mismatch and CRM have an original maturity of more than a year, the maturity mismatch haircut is applied to adjust the value.

  This is part of the sub process SFT Comprehensive Approach Haircut_in the process   SAMA SFT Placed Collateral Data Processing – STD.

- • **EAD Calculation for Exposures that are not part of netting agreement**

  For SFT transaction, the application calculates EAD for the parent exposure, based on the underlying information. The underlying exposures (which are the mitigants received and the collateral placed) are moved to **FSI_SFT_UNDERLYING** table from **FSI_CAP_MITIGANTS. FOREX** haircut is applied if the underlying and the parent contract are in a different currency. Each SFT underlying exposure adjusted for a haircut (EAD + haircut value) is added as EAD to the parent contract.

  This is part of the process SAMA SFT Exposure And Placed Collateral processing – STD.

- ▪ **EAD Calculation for Exposures that are part of the Netting Agreement**

  The application nets SFT contracts based on the same customer, common netting agreement identifier, the transaction of Repo, Re-Repo or Margin Lending, Trading or Banking book, and so on. Margin lending transaction being SFT also follows the same EAD calculation methodology. However, Repo or Reverse Repo and margin lending are not netted together.

  The calculation happens in the table FSI Cap Nettable pool (FSI_CAP_NETTABLE_POOL). This is handled in the process **SFT Netting Calculation**.

- • **Calculation of EAD – Simple Approach**

  As per the Simple Approach, the EAD is computed by considering the Exposure amount and the mitigants assigned being sent from the Credit Risk Mitigation process and assigned based on the Risk Weight of the Mitigants and the Exposures.

- ▪ **Exposure Amount Calculations for the Exposures**

  The exposure amount from the product processor tables **STG_REPO_CONTRACTS** and **STG_LOAN_CONTRACTS** for the respective products are based on their EOP balance which is the End of period balance that gets populated into the processing table (FSI_CAP_SFT_EXPOSURES) for further calculations. This is part of the process **SFT DATA POPULATION**.

- ▪ **Placed Collateral & Mitigant – Eligibility**

The mitigant is identified as eligible are not based on the eligibility rules for CRM as mentioned in the Basel III accord. Credit rating of the collateral is considered for all mitigants types issued by all party types while deciding whether a mitigant is eligible for a particular exposure or not. Separate eligibility Rules exist for mitigants types like equity, mutual funds, or debt security, to perform these checks. For the remaining, a mitigant is marked as eligible only if its credit rating is better than the exposure to which it is providing protection and also if it is classified as senior in position.

This is handled in the sub-process **SAMA Mitigant Data Processing - Standardized (FSI_CAP_MITIGANTS)**. Mitigant eligibility is also checked based on the original and residual maturity of the collateral. Collateral is classified as eligible only if its original maturity is more than a year and residual maturity is more than 3 months.

The placed collateral is captured in FSI Cap Placed Collateral (FSI_CAP_PLACED_COLLATERAL) and this also moves to FSI Cap Mitigants (FSI_CAP_MITIGANTS), wherein the placed collateral and the mitigants both undergo the same treatment. This is part of the sub-process **SAMA Mitigant Data Processing - Standardized** in the process **SAMA SFT Placed Collateral Data Processing - STD**.

- **Placed Collateral & Mitigant – Risk Weight Assignment**

  For the Simple approach, the application assigns risk weight to mitigants based on credit rating (CAP Mitigant Basel Rating and Risk Weight Assignment), and original maturity (CAP Mitigant RW Assignment based on Original Maturity). These fall under the process **Mitigant RW Assignment – Simple –BIS**.

  This is part of the sub-process **SAMA Mitigant Data Processing - Standardized** in the process **SAMA SFT Placed Collateral Data Processing – STD.**

- **EAD Calculation for Exposures that are not part of the Netting Agreement**

  For SFT transaction, the application calculates EAD for the parent exposure based on the underlying information.

  The underlying exposures (which are the mitigants received and the collateral placed) are moved to **FSI_SFT_UNDERLYING** table from **FSI_CAP_MITIGANTS.**

  This is part of the process **SAMA SFT Exposure And Placed Collateral processing – STD** .The SFT exposures EAD by considering the collateral placed and received are handled as part of the credit risk mitigation process. This is in the PMF process CRM Data Processing.

- **EAD Calculation for Exposures that are part of netting agreement**

  The application nets SFT contracts based on the same customer, common netting agreement identifier, the transaction of Repo, Re-Repo or Margin Lending, Trading or Banking book, and so on. Since the Margin lending transaction is also an SFT, it also follows the same EAD calculation methodology. However, Repo or Reverse Repo and margin lending are not netted together.

  The netted exposure of the SFT gets computed without the effects of the collateral received and placed in the FSI Cap Nettable Pool (FSI_CAP_NETTABLE_POOL). This gets handled in the process **SFT Netting Calculation**.

  The SFT exposures EAD by considering the collateral placed and received are handled as part of the credit risk mitigation process. This is handled in the PMF process **CRM Data Processing**.

7.2.2.6.2   Risk Weight Assignment

Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment processes. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessments are first moved into the table FSI Multiple Rating Processing (FSI_MULTIPLE_RATING_PROCESSING) wherein the ranking and final selection of which rating to use takes place.

Below are the related sub-processes:

- SFT Multiple Rating Assesment Population (SFT_MULTIPLE_RATING_ASSESSMENT_POPULATION_STD), wherein the data for the multiple assessment processing gets populated into the FSI table.

- Multiple Rating Assessment (MULTIPLE_RATING_ASSESSMENT), wherein the identification of the multiple rating for the exposure happens, and the

- SFT Multiple Assessment Basel Risk Weight Assignment (SFT_MULTIPLE_ASSESSMENT_BASEL_RISK_WEIGHT_ASSIGNMENT), wherein the actual risk weight and final rating assignment happen for the exposures.

Issue Issuer Assessment

For all the exposures which remain unrated after the multiple assessment processes, the issue issuer process is performed. This happens in the Issue Issuer Assessment sub-process **SAMA SFT Issue Issuer Assessment**.

In this scenario, the unrated exposures are assigned a reference rating based on the reference issue available or the rating of the party based on the applicability. These unrated exposures are assigned a risk weight based on the reference rating.

For unrated exposures, the application performs an issue-issuer assessment to infer a rating of the unrated exposures based on the rating of a similar instrument (referred to as reference issue hereafter) issued by the same issuer. The reference issue is used only when it is of the same currency as the exposure and the exposure is senior or equivalent to the same. For the unavailable reference issue, the party rating is used. In the case of the party also being unrated, the exposure remains unrated. Also, the application populates whether the exposure is LT rated or ST rated based on the rating assigned to the exposure.

Risk Weight Assignment

Risk Weight is assigned based on the asset class and the credit rating as per the Basel guidelines. The risk weight rules operate on the risk weight table (**FSI_RW_MAP_MASTER**). Highly rated exposures are allocated low-risk weight and poorly rated exposures are allocated high-risk weights. If exposure has more than one rating (rated by more than one agency), then the final rating is assigned based on multiple assessments. The application updates the risk weights against the exposures directly, when ratings are not considered.

Options for risk-weighting are selected during Run definition in the Run Management to update the required calculations as per the specific jurisdiction. For more information on the options, see the Run Management section.

Risk Weight Assignment occurs in the process **SAMA SFT Risk Weight Assignment - ST** for SFT Exposures.

Figure 40: Process Flow for Risk Weight Assessment
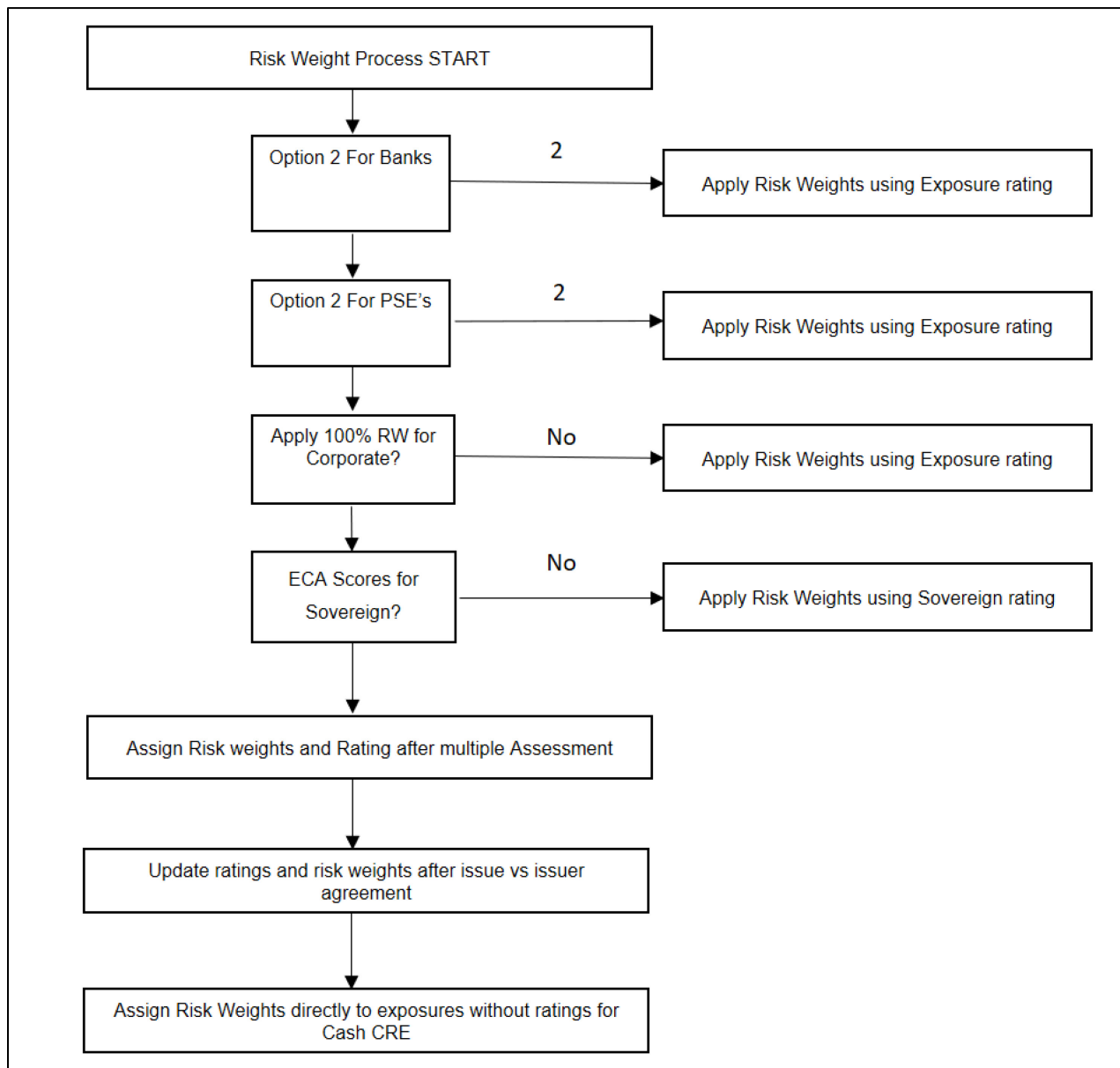
7.2.2.6.3 RWA Calculations

The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight.

7.2.2.7 Credit Risk Mitigation Process

To calculate the post-CRM RWA, the application needs to account for mitigants that may be in the form of collaterals (for Simple approach) or guarantees that are being provided by the bank. All the mitigants that get populated into the system are made ineligible, and then the regulatory approved mitigant types and the issuer type combination are made eligible.

7.2.3 Pooling and Optimizer

7.2.3.1 Pooling

Pooling is one of the prerequisites for the optimized allocation of the exposures.

Pooling pulls out exposure and identifies all the relevant mitigants mapped to it. It also identifies the following:

- Exposures mapped to these mitigants

- Newer mitigants mapped to these exposures

This pooling assigns the cardinality to the exposures based on the mitigant combination.

This happens in the FSI Cap Sub Exposures (**FSI_CAP_SUB_EXPOSURES**).

The relevant cardinalities that get assigned to the exposures, as part of this pooling process are as follows:

- 1-0➜One exposure not mapped to any mitigant

- 1-1 ➜One exposure mapped to one mitigant

- 1-N➜One exposure mapped to multiple mitigants

- N-1 ➜Multiple exposures mapped to a single mitigant

- N-N ➜Multiple exposures mapped to Multiple mitigants

7.2.3.1.1 Optimizer

The optimizer is the process of allocation of the mitigants to the exposures based on the different logics that are applicable for the various granularity. The details of these are available in the Annexure.

Both Pooling and Optimizer are handled under the process **SAMA CRM Non Sec Sub Exposure Pooling And Optimizer Processing** and **SAMA CRM Sec Sub Exposure Pooling And Optimizer Processing.**

7.2.3.2 Post CRM RWA

The application computes the covered amount and the uncovered amount for the exposures. The covered amount is computed by multiplying the covered factor with the exposure amount. To this covered amount, the application assigns the mitigant risk weight. The product of the covered amount and the mitigant risk weight is the covered RWA. The uncovered amount is computed by multiplying the uncovered factor (which is 1 – the sum of all covered factors for that exposure) with the exposure amount. This uncovered amount is multiplied by the exposure risk weight to get the uncovered RWA. The sum of the covered RWA and the uncovered RWA is the Post CRM RWA of the Exposure.

Figure 41: Calculation of Post CRM RWA

Post-CRM RWA = Covered Amount * Risk Weight of the Mitigant

+ Uncovered Amount * Risk Weight of the Exposure

This is handled in the process Post CRM Expected and Unexpected Loss RWA Assignment

7.3   Default Fund Contributions Related Capital Charge

A default fund contribution refers to the funds contributed, or commitments made by a clearing member to a Central Counterparty's (CCP) equalized loss-sharing agreement. The purpose of such default funds is to provide capital, in addition to the collateral posted by participants and in addition to capital provided by the clearinghouse, as a safeguard against extraordinary losses that might occur in connection with.

For example, a financial crisis in the market or the simultaneous defaults of several large members. The clearing members contribute to such default funds kept with the central counterparty (clearing house) in the proportion of their exposure to the central counterparty.

The default fund contributions by the clearing members contribute toward the central counterparty's regulatory capital along with CCP's contributions to the default fund. These contributions act as collaterals to mutually share in the losses incurred by the clearing members due to counterparty defaults.

For each clearing member, a contribution is made to the central counterparty's default fund.

This contribution acts as a relief against the defaults by any clearing member of the central counterparty.

CRR IV explains the methods that the banking organization playing the part of a clearing member of the CCP, must adopt and compute risk-weighted assets (RWA) for a non-qualifying and a qualifying CCP.

The application handles the treatment of exposures to a QCCP and a Non-QCCP. This qualified CCP flag is expected to be provided as a download in the Party Master (**STG_PARTY_MASTER**) table.

7.3.1   Capital Charge for Non-QCCP

If the CCP is not qualified (Non-QCCP), then the risk-weighted asset amount for the banking organization's default fund contribution is calculated using the Own fund's requirements for pre-funded contributions to the default fund of a non-qualifying CCP approach, as suggested in the accord.

7.3.2   Capital Charge for QCCP

If the CCP is a qualified CCP (QCCP), then the RWA amount is computed using one of the following two approaches stated below. Both are handled in the same sub-process **RWA For Default Fund Contribution With QCCP(RWA_FOR_DEFAULT_FUND_CONTRIBUTION_WITH_NON_QCCP)**. This is based on the run management option selected.

- Own funds requirements for pre-funded contributions to the default fund of a QCCP.

- An alternative calculation of own funds requirement for exposures to a QCCP.

The approach to the use of either the own fund requirements for QCCP or the alternative approach of the own fund requirements for QCCP is based on the run management option.

Approach 1

To compute the clearing member's capital requirement which is the reporting bank's capital requirement for the contributions made to the CCP's default fund, the hypothetical capital requirement of the central counterparty for the default fund must be understood. This must be calculated by the central counterparty based on the exposures of all the clearing members to the default fund. After this figure is calculated by the CCP, it is then shared with all the clearing members to enable them, and to compute their respective capital requirements against the default fund.

When the reporting bank gets the hypothetical capital requirement from the QCCP, the next step is to compute the capital requirement of the reporting bank by finding out the proportion of the reporting bank's contribution in the total default fund contribution.

The parameters considered for this purpose include the following QCCPs:

- Net potential exposure to the two largest clearing members

- The total net potential exposure to all the clearing members

- Total default fund contribution by all the clearing members

- QCCP's contribution to the default fund

- The total number of clearing members for the default fund

The last step is to compute the risk-weighted assets of the reporting bank corresponding to the default fund contribution to the QCCP by using the capital computed in the previous step.

The steps and the calculation involved in this process are the following:

Step 1:

It requires the QCCP to calculate its hypothetical capital requirement (KCCP) for the default fund. This is performed by the QCCP and is published to the clearing members for them to use for their respective capital calculations.

Step 2:

Compare KCCP with the funded portion of the default fund of a QCCP and calculate the capital requirement of the bank (KCM) by using the total of all the clearing members' capital requirements (K*CM). This capital requirement is considered on the contribution that the clearing members make to the default fund of the QCCP.

Approach 2

Capital Charge for the default fund contribution is calculated as follows:

Capital charge (Ki) = 8% * minimum (2% of Trade exposures to the QCCP + 1250% * default fund contribution to the QCCP, 20% * Trade Exposure Amount to the QCCP).

The application also supports the treatment of a CCP stopping to calculate its fund requirement to the CCP. The flag to indicate that the CCP has stopped calculating the own fund requirement is captured in the party table (**STG_PARTY_MASTER**). Based on the supervisory approval provided, in the run management option, the capital is calculated using the Alternative approach. Otherwise, it is treated as a normal Credit Risk Exposure as part of the Corporate Asset class.

The flag to indicate that the CCP has stopped calculating the capital requirement is expected as part of the Party Master Table (**STG_PARTY_MASTER**). In the case of this flag being null, it is expected that the CCP is calculating the Total Capital and normal processing of QCCP or Non-QCCP happens.

Key Data Elements

Key data elements to be noted are listed in this section. To view the complete list of tables used, see the Download Specification document in [MOS](MOS).

- Default fund contributions and related data are expected at the Default fund – Central Counterparty level in the entity Stage Central Counterparty Details (STG_CCP_DETAILS).

- Hypothetical Capital Requirement of CCP, Maximum Net Potential Exposure of clearing member of CCP, 2nd Maximum Net Potential Exposure of clearing member of CCP, Total Net Potential Exposure of clearing member of CCP, Number of Clearing Members to the CCP, Total funded Default Fund Contribution of all clearing members to the CCP, Total unfunded Default Fund Contribution of all clearing members to the CCP and Default fund contribution of CCP from its funds for each central counterparty level required.

- The application supports only the capital requirement of the bank (KCM) based on Funded/Unfunded default contributions from all clearing members not by Initial Margin. But the data model supports placeholders to capture Total Initial Margin by all clearing members to CCP and Bank's initial margin posted to CCP.

7.4 Underlying Exposures Treatment

UNDERLYING FLOW

Underlying Flow Related to Securitization

The application also supports Underlying exposures that are received as input through the Stage Underlying Exposures table (**STG_UNDERLYING_EXPOSURES**). This is relevant for the securitization exposures,

Banking Underlying Exposures

For these exposures, the parent exposures are securitization exposures, mapped via the securitization pool, but the underlying is Banking exposures.

In such cases, exposures the record type **INV_NON_SEC_ULY** (Investment Underlying) and are populated and processed in the Banking table **FSI_CAP_BANKING_EXPOSURES**. This is handled in the process **SAMA Banking Underlying Data Processing –STD.**

Investment Underlying Exposures

For these exposures, the parent exposures, as well as the underlying exposures are both investment exposures. Such exposures have the record type **INV_NON_SEC_ULY** (Investment Underlying) and are populated and processed in the Investments table **FSI_CAP_INVESTMENT_EXPOSURES**.

This is handled in a way similar to the normal investment exposure in the process **SAMA Investment Data Processing – STD**.

Underlying Flow Related to CIU

The application also supports Underlying exposures that are received as input through Stage Fund Underlying Composition table (**STG_FUND_UNDERLYNG_COMPOSITION**). This is relevant for the CIU exposures, the application also supports the underlying composition received as input through the Stage Fund CIS Composition table (STG_FUND_CIS_COMPOSITION)

Investment Underlying Exposures

For these exposures, the parent exposures and the underlying exposures are both investment exposures. Such exposures have the record type **INV_NON_SEC_ULY** (Investment Underlying) and are populated and processed in the Investments table **FSI_CAP_INVESTMENT_EXPOSURES**.

Derivatives Underlying Exposures

For these exposures, the parent exposures are investment exposures, but the underlying is Derivatives exposures. Such exposures will have record type as **INV_NON_SEC_ULY** (Investment Underlying) and will be populated and processed in the Derivatives table FSI_CAP_DERIVATIVES.

This is handled in the process **SAMA Derivatives Underlying Data Processing -STD**.

7.5   Credit RWA for Securitization

As per the revised guidelines for the securitization framework which is focused on addressing the short comes of the existing guidelines, a revised hierarchy of approaches that replaces the existing approaches have been introduced.

The application assigns the appropriate approach to the exposures, based on the criteria specified in the Revised guidelines. The application assigns any of the below approaches under the securitization standardized approach:

- Sec-External Ratings Based Approach (SEC-ERBA)
- Sec – IAA Approach
- Sec-Standardized Approach (SEC-STD)- SSFA
- Sec 1250% RW

7.5.1   Securitization – Revised Framework

The procedure by which the application handles the advanced approach of securitization exposures is as follows:

Figure 42: Securitization – Revised Framework Process Flow

7.5.2 Rating Population

Credit Rating Process

The entire rating information of the exposures and the mitigants are populated from the staging tables to the processing tables. The exposure and the tranche rating information are captured in the account rating (**STG_ACCOUNT_RATING_DETAILS**) and the instrument rating (STG_INSTRUMENT_RATING_DETAILS) tables respectively and the mitigant rating information is captured in the instrument rating details (**STG_INSTRUMENT_RATING_DETAILS**) table.

- Account Rating Table (STG_ACCOUNT_RATING_DETAILS)

  - Credit Rating for all exposures

- Instrument Rating Table (STG_INSTRUMENT_RATING_DETAILS)

  - Credit Rating for all tranche and mitigants

- Party Rating Table (**STG_PARTY_RATING_DETAILS**)

  - Credit Rating for all issuers are captured in this table.

- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)

  - Credit Rating for all countries is captured in this table.

The Processing Steps are as follows:

Banks obtain credit ratings from different sources and these are provided as an input in the application through the rating tables mentioned in the preceding list.

This is handled in the process **RATING_RECLASSIFICATION_POPULATION.**

The application re-classifies the rating information to BIS Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short Term ratings.

This is handled in the process **Credit Rating Reclassification**.

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables.

Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) by using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

You must ensure that all the relevant columns as indicated in the DL Specs are populated with data. For example, in the Stage Party Rating Details (STG_PARTY_RATING_DETAILS) table, Rating source code (V_RATING_SRC_CODE), Party Code (V_PARTY_CD), and Purpose (V_PURPOSE) must be populated. The purpose code is to indicate whether the rating is domestic or foreign. If any other rating is provided, then the exposure is considered unrated.

7.5.3 Data Population

7.5.3.1 Pre Processing Steps

Securitization and Mitigant Data Population with Mitigant Mapping

For an investing bank, the data is expected in the Stage Underlying Exposures (**STG_UNDERLYING_EXPOSURES**) for the underlying of the pool, Total Pool Level attributes in the Stage Pool table (**STG_SECURITIZATION_POOL**), Tranche Level attributes in the Stage Tranche table (**STG_SECURITIZATION_TRANCHE**), and the Exposure Level Attributes in the respective PP tables.

For an originator, the data is expected in the same manner as the Investor.

For a credit protection exposure in the form of guarantee, it is expected in the Stage Guarantees table (**STG_GUARANTEES**); and if it is a credit derivative, it is expected in the Stage Credit Derivatives table (**STG_CREDIT_DERIVATIVES**). If it is regular investment in the Tranches by an investing bank or whether

it is part of the mandate for retention in the pool or tranche for an originating bank, the data is expected in the Stage Investments table (**STG_INVESTMENTS**).

For a liquidity facility exposure or servicer cash advance, the exposures are expected in the Stage Commitment Contracts table (**STG_COMMITMENT_CONTRACTS**).

For the securitization hedges performed through swaps the exposures are expected in the stage swaps contracts table (**STG_SWAPS_CONTRACTS**). This is handled in the process Sec Data Population

When you consider securitization, the underlying exposures that are not securitization exposures follow the process related to the non-securitization exposures. The underlying exposures that are securitization exposures, follow the process related to securitization exposures.

The mitigants data are populated from the staging table to the processing table. The exposures that are mapped to the mitigants are captured and populated from the staging table to the processing table.

Mitigant data population is handled by the process **Mitigant Data Population** in SAMA Common Data Processing.

Exposure mitigant mapping population is handled in the process Account Mitigant Mapping Population(**ACCT_MITIGANT_MAPPING_POP)**.

7.5.4 Shareholding Percent Multiplication

Shareholding percent multiplication for common entity-level data is a part of the **BIS Common Data Processing** (PMFCOM020) process. In this processing, the application updates the shareholding percentage against each entity. The parent entity is updated with the value of 1 as the shareholding percent, and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PCT).

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity related to the parent entity against exposure amount, undrawn amount, and provision amount for that exposure, and updates the same.

This is handled in the process **Sec Data Population(SEC_DATA_POPULATION).**

7.5.5 Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, it forms an asset class for each exposure is arrived at. Similarly, the application does reclassification for mitigant based on its mitigant types and reclassifies it to standard mitigant types.

You must ensure that all products and party types and mitigants which are bank-specific are reclassified as part of the setup activity. If they are not reclassified, the treatment may not happen as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product types. For Example, Housing Loan is reclassified as Residential Mortgage Exposure.

This is handled in the **OFSAA-Basel Product Type Classification** that is part of the Common Reclassification (COMMON_RECLASSIFICATION) process **Party Type Reclassification**.

Similar to the product type, the customer type (which is stored as counterparty type) is also reclassified as the standard counterparty type. The Basel application is designed to include customer type, and legal entity type in a single table (STG_PARTY_MASTER). This is applicable for staging and the dimension model. These are reclassified together as well. Party type reclassification Rules handle reclassification for customer, and entity types. For Example, an Individual is reclassified as Retail.

This is handled in the Basel **Party Type Reclassification** which is part of SAMA Other Reclassification process.

Mitigant Reclassification

For mitigants, the application reclassifies the mitigant type to the standard mitigant types such as debt securities, cash, and so on.

The reclassification tasks are present in the Common Reclassification (COMMON_RECLASSIFICATION) process.

Other Reclassification

As part of the reclassification rules, any other data which is being brought inside the application such as Pool Type, seniority, transaction type, and so on also get reclassified into OFSAA specific values. If you do not perform this task, data will not be available for processing as required by the regulator. This happens as part of the process Common Reclassification (COMMON_RECLASSIFICATION).

7.5.6 Asset Reclassification Rules

This is applicable only for the underlying exposures.

7.5.7 Due Diligence Requirement for Securitization Exposures

If a banking organization can meet due diligence requirements, a Bank can follow any risk weight approach under securitization to all its securitized exposures as per the revised hierarchy of approaches. If bank is not able to meet the due diligence requirements, then all the exposures are risk-weighted at 1250%.

The application assigns the appropriate approach to the exposures, based on the criteria specified in the Revised Accord.

This happens in the process **SAMA Sec Data processing STD**.

7.5.8 Sec Approach Selection

If the banks follow the standardized approach for their credit risk of Non-securitization approaches, the hierarchy is SEC-ERBA, SEC-IAA, SEC-STD, and 1250% Risk Weight,

SEC-ERBA (Sec – External Ratings Based Approach) subject to supervisory approval is based on the external ratings assigned to the exposures or the instruments, and also depends on other attributes such as maturity and tranche thickness.

In case of absence of external rating, the exposures undergoes SEC-IAA (Internal Assessment Approach) based on supervisory approval.

If these approaches are not applicable, then the exposures will be assigned a risk weight using SEC-STD Approach.

And if none of the approaches are applicable then the exposures will be assigned a risk weight of 1250%.

This happens as part of the sub-process Securitization Risk Weight Methodology Assignment in the process **SAMA Sec Data processing STD**.

7.5.8.1 Pre-mitigation Calculations

The application calculates the Pre-Credit Risk Mitigation (CRM) Exposure at Default (EAD) for each exposure. This value signifies the maximum loss that the bank can suffer if there is a default on this exposure before considering any mitigation effects.

The application also computes pre-mitigation risk-weighted assets (Pre CRM RWA) and post-mitigation risk-weighted assets (Post CRM RWA) by multiplying the respective EAD by risk weight. The risk weight is determined by using the hierarchy of approaches.

7.5.8.2 Exposure at Default Amount Calculation

Exposure at Default (EAD) is calculated using the Exposure Amount (EOP Balance of the Exposure), Undrawn Amount of the Exposure (Undrawn Amount) and also the Credit Conversion Factor for the Off-Balance sheet Amount (CCF). This is computed for the on-balance sheet products separately, and the off balance sheet products separately.

This is handled in the sub process SEC Pre CRM EAD Calculation under the process SAMA Sec Data processing STD..

7.5.8.3 Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment process. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessments are first moved into the table FSI Multiple Rating Processing (FSI_MULTIPLE_RATING_PROCESSING) wherein the ranking and final selection of which rating to use takes place.

This happens in the process of **SAMA Sec Multiple Assessment**, under that sub-process the application has data transformation separately for exposures and its tranches.

7.5.8.4 Risk Weight Assignment

Sec-External Ratings Based Approach (SEC-ERBA)

If there is a supervisory approval, the application continues with the computations. Otherwise, it looks for the next approach.

For exposures that follow the external ratings-based approach, the risk weight assignment is based on the criteria used for risk weighting. This is handled as part of the sub-process **SEC_RISK_WEIGHT_ASSIGNMENT_BASED_ON_RATINGS**.

The application uses the seniority position of the exposure, maturity, thickness of the exposure, and the credit rating to assign the risk weight to the exposure.

To ensure that the exposures have the risk weight assigned based on their maturity term, the application supports interpolation of the risk weight to accommodate the varying maturity of the exposures.

The DT which is used for interpolation is Securitization Interpolated Risk Weight (Sec_Interpolated_RW) which updates interpolated risk weights for each exposure in the FCT_SEC_EXPOSURES table. Exposures that are updated include "STC condition met" exposures and "STC condition not met " exposures.

This happens in the sub-process **SAMA SEC Interpolated Risk Weight And Avg Exs Sprd** in the **SAMA Sec Data processing STD**.

When the risk weights are assigned, the application calculates the Securitization Risk Weight Assignment for rated Exposures under the process **SAMA Sec Data processing STD**.

SEC-IAA

Sec IAA is followed in the application based on the Internal assessment on the exposures and also based on the ABCP indicator. The exposures with that flag enabled F_ABCP_IND will undergo the SEC_IAA approach. The Sec IAA is also to be followed based on the supervisory approval. This SEC-IAA methodology is assigned on the sub-process **Securitization Risk Weight Methodology Assignment** in the process **SAMA Sec Data processing STD**.

After the approach assignment is completed, the application calculates the Risk weight as part of the sub-process **Securitization Risk Weight Assignment for rated Exposures** in the process **SAMA Sec Data processing STD**.

Sec-Standardized Approach (SEC-STD)

For exposures following the sec-standardized approach, the application calculates the underlying weighted average capital requirement of the securitization pool (KSA). This is handled in the sub-process **Securitization Pool Capital Charge Calculation using STD approach**.

Other parameters that are needed for SEC-STD approach are calculated by the application based on the underlying data. This is handled as part of the sub-process SAMA Sec Tranche Credit Enhancement Calculations and the pool level data calculation happens as part of the sub-process **Securitization Pool Deliquent Balance Calculation** (SEC_POOL_DELINQUENT_BALANCE_CALCULATION).

After all the parameters are calculated, the application computes SSFA (Simplified Supervisory formula approach) capital and uses the following logic for risk weight computation. The exposures for which are detachment point (D) less than that of the KA, the exposures are deducted (it is risk-weighted at 1250%). The exposures for which the credit enhancement level is more than that of the KA, the exposures calculates the KSSFA (SSFA capital charge). The exposures for which the credit enhancement level is less than that of the KA but the sum of the credit enhancement level and the tranche thickness are more than the KA, the exposures are straddled. The tranche to which the exposure belongs is split into a position below KA and a position above KA. All the exposures mapped to the straddled tranche are also split by the application in the same proportion as the split tranche. Post-straddling risk weight is computed using the computation logic mentioned by the accord.

This happens as part of the sub-process **Securitization Tranche Parameter Calculations** (SEC_TRANCHE_PARAMETER_CALCULATIONS).

For the calculation of Risk weight under standardized approach (SEC_STD), the following sub-processes in the application calculates the respective values mentioned above in the processing table for each exposure. This happens as part of the sub-process **Sec SA Pre CRM Capital Calculation** which is in the process **SAMA Sec Data processing STD**.

Maximum RW for Exposures

Maximum risk-weight requirements for senior exposures for all the pools are handled by the application as per the logic given in the accord.

For Maximum capital requirement, to apply a maximum capital charge to a bank's securitization exposure, the largest proportion of interest that the bank holds for each tranche of a given pool (P) is required. For a bank that has one or more securitization exposure(s) that reside in a single tranche of a given pool, P equals the proportion (expressed as a percentage) of securitization exposure(s) that the bank holds in that given tranche (calculated as the total nominal amount of the bank's securitization exposure(s) in the tranche) divided by the nominal amount of the tranche. For a bank that has securitization exposures that reside in different tranches of a given securitization, P equals the maximum proportion of interest across tranches, where the proportion of interest for each of the different tranches must be calculated as described above.

This happens in the sub-process Securitization Parameter Update to Exposures under the process SAMA Sec Data processing STD.

If none of the approaches are applicable for the exposures, then 1250% Risk Weight is applicable. This approach assignment occurs as part of the sub-process **Securitization Risk Weight Methodology Assignment** in the process SAMA Sec Data processing STD. After this sub-process is completed, the risk weight calculation occurs based on the Sec 1250% risk weight in the sub-process **Sec Risk Weight Calculation** in the process **SAMA Sec Data processing STD**.

Re-securitized exposure

Re-securitized exposures are those exposures that are issued out of a pool of underlying exposures which constitute non-securitized exposures and some portion of securitized exposures. The application is capable of handling both securitized exposures and re-securitized exposures.

The securitized underlying of the re-securitization pool is captured in Stage underlying Exposures (STG_UNDERLYING_EXPOSURES). As per the revised framework, the approach that should be used for risk weight calculation is a standardized approach only as no other approaches are applicable. The application assigns the same approach based on the re-securitization flag. For these exposures, the parameters that are used in the standardized approach are calculated for both non-securitized and securitized exposures using the logic mentioned in the revised accord.

This happens in the sub-process **ReSEC Pool RW Calculations** in the process **SAMA Sec Data processing STD**.

STC Transactions (STC Transaction)

As per the revised Basel guidelines, the transactions with simplicity means the following:

- Homogeneity of the underlying assets belongs to the same products/characteristics

- Transparency of the underlying assets

- The details of the transactions have sufficient information

- Easily comparable against the equivalent transactions

The eligibility of these conditions is checked for the transactions and these transactions are handled separately by the application

This is handled in the sub-process Securitization Eligilbiility for **STC Transactions** (SEC_ELIGIBILITY_FOR_STC_TRANSACTIONS) under the process **SAMA Sec Data processing STD**

When the Eligibility conditions are checked for the exposures based on the above sub-process, the respective exposures are handled in the downstream sub-process in the application which is stated in the various approaches.

Sec Pre-CRM RWA Computation

The application calculates the Pre-CRM RWA for the exposures by multiplying the Pre-CRM EAD with the risk weight of the exposures. Pre-CRM RWA is computed in the Sec Pre-CRM RWA Computation sub-process.

7.5.8.5   Credit Risk Mitigation Process

To calculate the post-CRM RWA, the application needs to account for mitigants which may be in the form of collaterals, guarantees, credit derivatives. Not all mitigants are eligible for RWA computation. All the mitigants which get populated into the system are being made ineligible, and then the regulatory approved mitigant types and the issuer type combination are made eligible in Mitigant Processing.

Mitigant Data population

Mitigant data is loaded from the Stage Mitigant table (STG_MITIGANTS) into the FSI CAP Mitigants table (FSI_CAP_MITIGANTS) where further processing takes place. This occurs in the sub-process **Mitigant Data Population** under the process **SAMA Mitigant Data Processing.**

Mitigant Multiple Assessment

Similar to exposures with multiple ratings, mitigants with multiple ratings are also subject to Multiple rating Assessments. This is handled in the sub-process **Asset Class Based Mitigant Multiple Rating Assessment** in the process **SAMA Mitigant Data Processing – Standardized.**

Then based on the Asset class of the Mitigant the relevant Risk Weight is assigned in the sub-process **Asset class Based Mitigant Multiple Assessment Risk Weight Assignment** in the **SAMA Mitigant Data Processing – Standardized**.

7.5.8.5.1   Mitigant Eligibility Approaches and their Risk Weighting Rules

Mitigant Risk Weight

Based on the Asset class of the Mitigant the relevant Risk Weight will be assigned in the sub-process Asset class Based Mitigant Multiple Assessment Risk Weight Assignment in the SAMA Mitigant Data Processing – Standardized. Further, the application assigns the risk weight to mitigants based on the various asset classes where it assigns the risk weight to selective Mitigant types such as Cash, Cash in process, Equity and Gold (**CAP Mitigant Risk Weight Assignment for Asset Classes - STD**) and for Nettable Liabilities (**CAP Mitigant RW Assignment for Nettable Liabilities**). These fall under the process **Post Crisis Mitigant Risk Weight Assignment** and these are applicable for Simple and Comprehensive approaches.

In the Comprehensive approach, for Mitigant types such as financial collaterals is handled in **CAP Mitigant RW Assignment for Financial Collaterals - Comprehensive Approach**. These fall under the process **Post Crisis Mitigant Risk Weight Assignment.**

Mitigant Eligibility

The application identifies the eligible mitigants based on the criteria as mentioned by the Regulator. The application identifies the following standard mitigants - collateral, guarantees, and credit derivatives.

The application is capable of using the Simple Approach and the Comprehensive Approach for the mitigants which are part of the collateral. The application identifies the eligibility of the financial collateral

separately for the simple approach and the comprehensive approach. The eligibility of the collateral mitigants are based on the party type of the mitigant, mitigant types, the credit rating assigned to the mitigant or the party (as applicable), and whether the classification of collateral is senior or not.

For equity, the eligibility is based on the main index equity and the equity trading status. This is handled in **CAP Collateral Eligibility - Simple Approach - Equity** in the process **PCR Mitigant Eligibility - Simple Approach - ECRA**.

The application identifies the eligibility of the guarantees and credit derivatives based on the party type of the mitigant and the credit rating assigned to the issuer of the mitigant. This is handled in **CAP Mitigant Eligibility - Based on Rating for Mitigant Covering Securitization Transactions - ECRA** under the process **PCR Mitigant Eligibility - Simple Approach - ECRA**

Similar mitigant eligibility rules for Comprehensive Rule can be found in the **process PCR Mitigant Eligibility - Comprehensive Approach – ECRA.**

The option for the bank to select Collateral Simple Approach or Comprehensive Approach is based on the Run Management option as selected in the UI.

7.5.8.5.2   Mitigant Haircut Assignment

In the Standardized approach, the bank has to follow supervisory estimates for Mitigant Haircut assignment. This is based on various categories such as mitigant type, residual maturity, rating, issuer type, and so on. This is applicable only if the bank follows the Comprehensive approach for collateral.

Only eligible mitigants are considered for haircut assignment and further processing. Post haircut assignment, the eligible mitigants are moved from the mitigants table (FSI_CAP_MITIGANTS) to the sub-exposures table (FSI_CAP_SUB_EXPOSURES).

The application performs computations for three kinds of mitigant haircuts: volatility haircut, FOREX haircut, and maturity mismatch haircut.

Volatility Haircut

Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. The application assign haircuts for various type of financial collateral like debt securities, equity, mutual funds, and so on. In the supervisory haircut method, the application assigns volatility haircut based on issues, issuer's ratings, mitigant's residual maturity, and type of mitigant.

This is handled in the sub processes **CRM Mitigant Volatility Haircut for Collateral - Supervisory Haircut, CRM Mitigant Volatility Haircut for Cash and Gold - Supervisory Haircut, SAMA - CAP CRM Mitigant Volatility Haircut for Equity - Supervisory Haircut, CAP CRM Underlying Mitigant Volatility Haircut Assignment and CAP CRM Mitigant Volatility Haircut for Mutual Fund - Supervisory Haircut** in the **Mitigant Haircut Assignment - Comprehensive Approach** process.

Forex Haircut

If the exposure and collateral are in different currencies, then the application adjusts by applying the FOREX haircut.

This is handled in **CAP CRM Forex Haircut** under the **CRM Sub Exposure Data Haircut Assignment** process.

Maturity Mismatch Haircut

If the residual maturity of the Credit Risk Mitigant is less than that of the underlying credit exposure, then a maturity mismatch haircut is applied to adjust the value.

This is handled under the **CAP CRM Maturity Mismatch Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

7.5.9   Pooling and Optimizer

7.5.9.1   Pooling

Pooling is one of the pre-requisite for the optimized allocation of the exposures.

Pooling pulls out exposure and identifies all the relevant mitigants that are mapped to it, the corresponding exposures mapped to these mitigants, and the corresponding newer mitigants mapped to these exposures. This pooling assigns the cardinality to the exposures based on the mitigant combination.

This happens in the FSI Cap Sub Exposures (FSI_CAP_SUB_EXPOSURES).

The relevant cardinalities that get assigned to the exposures, as part of this pooling process are as below:

- 1-0➜One exposure not mapped to any mitigant

- 1-1 ➜One exposure mapped to one mitigant

- 1-N➜One exposure mapped to multiple mitigants

- N-1 ➜Multiple exposures mapped to a single mitigant

- N-N ➜Multiple exposures mapped to Multiple mitigants

7.5.9.1.1   Optimizer

The optimizer is the process of allocation of the mitigants to the exposures, based on the different logic applicable for the various granularity. For more information, see Annexure.

Both Pooling and Optimizer are handled in the process **SAMA CRM Non Sec Sub Exposure Pooling And Optimizer Processing** and **SAMA CRM Sec Sub Exposure Pooling And Optimizer Processing.**

7.5.9.1.2   Post CRM RWA Computation

The application calculates the covered amount and the uncovered amount for the exposures. The covered amount is computed by multiplying the covered factor with the exposure amount. To this covered amount, the application assigns the mitigant risk weight. The product of the covered amount and the mitigant risk weight is the covered RWA. The uncovered amount is computed by multiplying the uncovered factor (which is 1 – the sum of all covered factors for that exposure) with the exposure amount. This uncovered amount is multiplied by the exposure risk weight to get the uncovered RWA. The sum of the covered RWA and the uncovered RWA is the Post CRM RWA of the exposure.

7.6   Operational Risk Portfolio

Operational risk is a risk of loss resulting from inadequate or failed internal processes, people and systems, or external events". External Losses can occur due to Misappropriation of Assets, Tax Evasion, Theft of information, hacking damage, Third-party theft, or forgery. The Capital Adequacy guidelines prescribed by BIS has prescribed three methods for calculating Operational Risk capital charges and banks can use any of these methods to calculate capital charge:

Figure 43: Process Flow for Operational Risk Portfolio
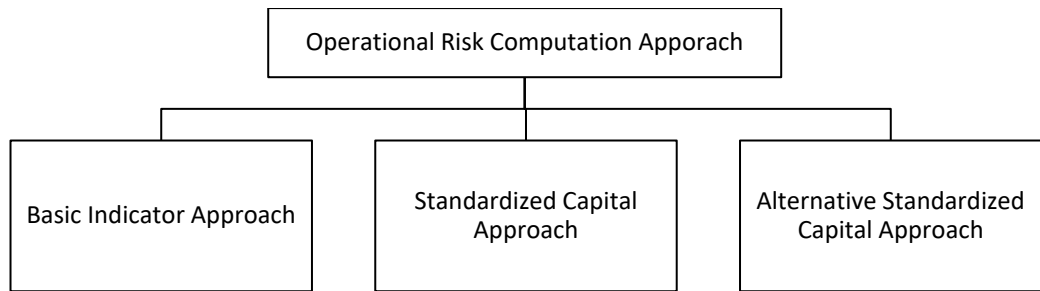
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                    │ Operational Risk Computation Apporach│
                    └─────────────────────────────────────┘
                                     │
        ┌────────────────────────────┼────────────────────────────┐
        │                            │                            │
┌───────────────────┐   ┌───────────────────────┐   ┌───────────────────────┐
│                   │   │                       │   │                       │
│  Basic Indicator  │   │  Standardized Capital │   │ Alternative Standardized│
│     Approach      │   │       Approach        │   │   Capital Approach    │
│                   │   │                       │   │                       │
└───────────────────┘   └───────────────────────┘   └───────────────────────┘
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When executing Solo Run for computing Operational Risk, the parent entity data is processed. However, for a Consolidated Run, the parent entity and the subsidiary data are processed.

Process Flow for Operation Risk RWA

Figure 44: Process Flow for Operation Risk RWA

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┌─────────────────────────────────────────────────────────┐
│           Operational Risk Data Population                │
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                          ⇩
┌─────────────────────────────────────────────────────────┐
│        OR Internal LoB to Standard LoB Reclassification   │
└─────────────────────────────────────────────────────────┘
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┌─────────────────────────────────────────────────────────┐
│            OR Basel Methodology Assignment                │
└─────────────────────────────────────────────────────────┘
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┌─────────────────────────────────────────────────────────┐
│            OR Annual Gross Income Calculation             │
└─────────────────────────────────────────────────────────┘
                          ⇩
┌─────────────────────────────────────────────────────────┐
│                OR Beta Factor Calculation                 │
└─────────────────────────────────────────────────────────┘
                          ⇩
┌─────────────────────────────────────────────────────────┐
│     Operational Risk Entity Capital Charge Computation    │
└─────────────────────────────────────────────────────────┘
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│ Operational Risk Line of Business Capital Charge Computation │
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┌─────────────────────────────────────────────────────────┐
│               Operational RWA Calculation                 │
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┌─────────────────────────────────────────────────────────┐
│            Operation RISK SUMMARY POPULATION              │
└─────────────────────────────────────────────────────────┘
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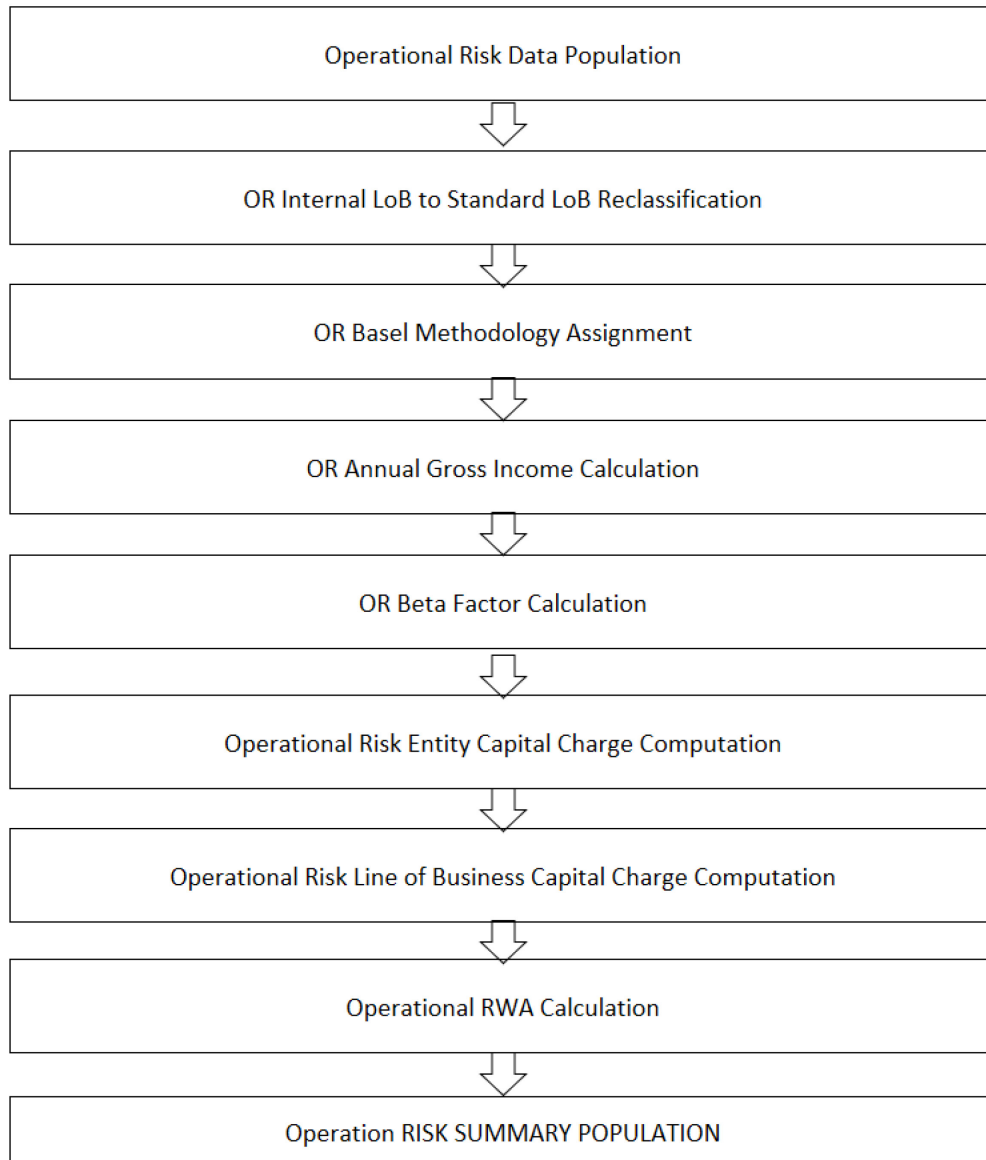
7.6.1   Data Population

The data required for the Operational Risk RWA calculations are part of the Stage Operational Risk Data (STG_OPS_RISK_DATA). This is the entity-level information for various operational attributes related to the entities and the Lines of business.

All the other data related to entities, as detailed in the Capital Structure and Common section will have to be provided, to help in the identification of whether the entities are part of consolidation or not.

This is handled in the rule OPS_RISK_DATA_POPULATION

7.6.2   Shareholding Percent Multiplication

For all the entities, which are part of regulatory consolidation and parent shareholding percentage is required is getting updates the shareholding percentage against each entity data. These details are

captured in the Stage Entity Shareholding Details (STG_ENTITY_SHR_HLD_PERCENT) table. And using the shareholding percentage applicable for the entity, based on the solo or consolidation level, all the amount columns are multiplied by the corresponding shareholding percent.

This is handled in the Rules:

- OR Operating Income and Expense shareholding Percent Multiplication

- Shareholding Percent Multiplication of Balance sheet Attribute for Operational Risk

- OR Non-Operating Income and Expense shareholding Percent Multiplication

- OR Other Income and Expense shareholding Percent Multiplication

- OR Other Income and Expense shareholding Percent Multiplication

7.6.3 Reclassification Rules

In the case of Operational Risk, the key reclassification rules are related to the entity type which is based on the party type reclassification as detailed in the Credit risk section. The other relevant reclassification rules are for the LOB Reclassification.

7.6.3.1 Line of Business Reclassification

- The internal lines of business as maintained by the bank, are reclassified into Basel standard lines of business as provided by the regulator for calculation of the operational risk

- This is handled in the rule OR Internal LoB to Standard LoB Reclassification

7.6.4 Capital Charge Approaches

As part of the approaches suggested by the regulator for Operational Risk, the bank can follow one of the approaches, based on the supervisory approval, and a bank meeting the operational requirements to comply with these guidelines.

- Basic Indicator Approach

- Standardized Approach

- Alternative Standardized Approach

7.6.4.1 Basic Indicator Approach

7.6.4.1.1 Capital Charge Calculation

The capital charge is calculated by multiplying the alpha value with the annual gross income of each year across each standard line of business. The average of 3 years is considered by the application, in sync with the regulatory ask. If the values of all the 3 years are not positive, then zero or the negative value from numerator and denominator is excluded.

In this approach, the alpha value is a fixed value set by the regulator.

This is handled in the rule **Opr_Risk_Capital_Charge**.

7.6.4.1.2 Risk-Weight Asset Calculation

The capital charge value obtained is converted to the equivalent RWA value by multiplying with the factor of 12.5.

Operational Risk-Basic Indicator Approach - Data Population

Figure 45: Operational Risk-Basic Indicator Approach - Data Population
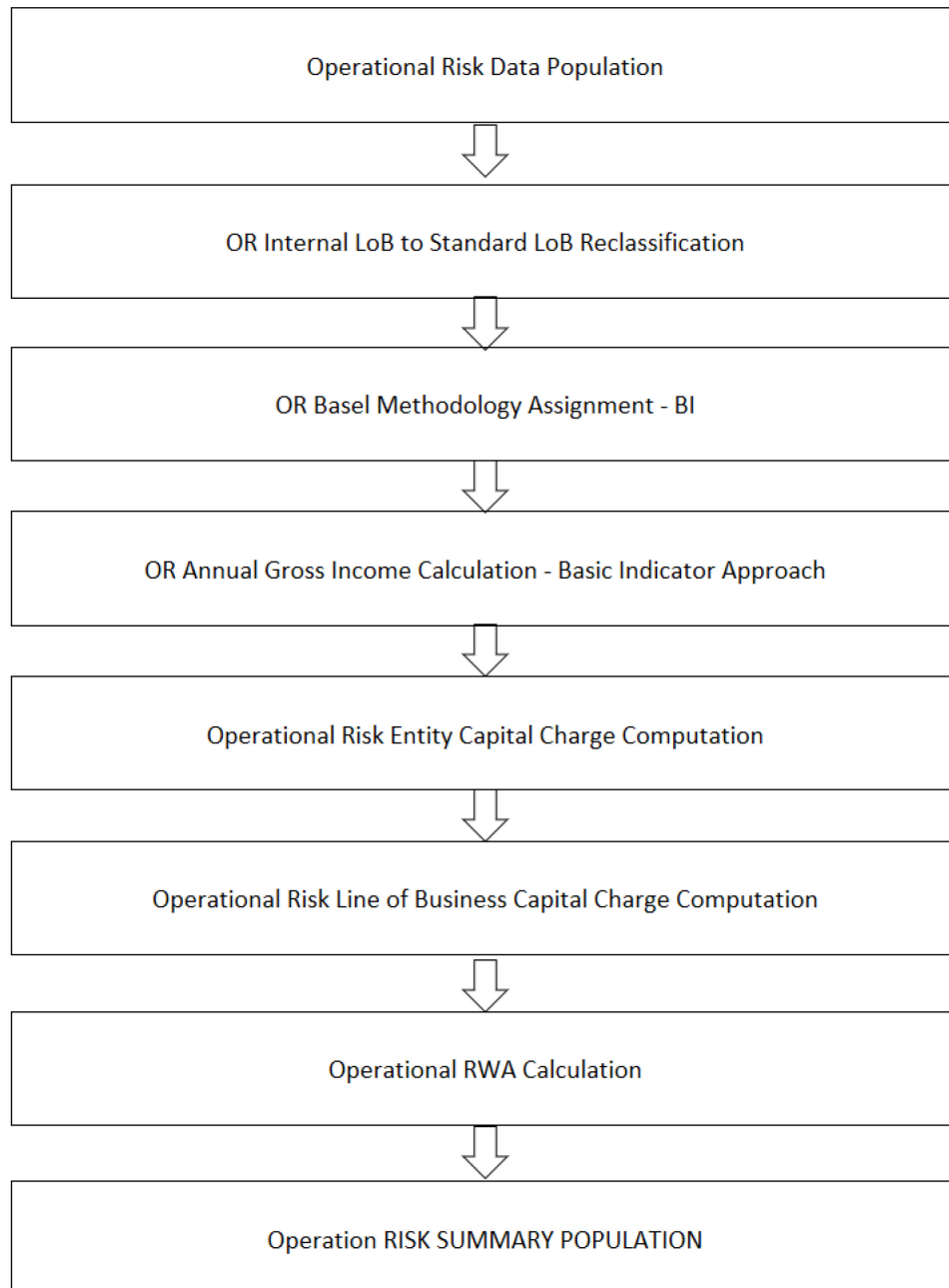
7.6.4.2 Standardized Approach

In this approach, the LOB reclassification is expected to reflect the relevant LOB provided by the regulator.

7.6.4.2.1 Capital Charge Calculation

The capital charge is calculated by multiplying the beta value with the annual gross income of each year across each standard line of business. The average of 3 years is considered by the application, in sync with the regulatory ask. If the values of all the 3 years are not positive, then zero or the negative value from numerator and denominator is excluded.

In this approach, the beta value is a fixed value set by the regulator for each of the individual Lines of Business.

This is handled in the following rules:

- Operational Risk Entity Capital Charge Computation

- Operational Risk Line of Business Capital Charge Computation

7.6.4.2.2 Risk-Weight Asset Calculation

The capital charge value obtained is converted to the equivalent RWA value by multiplying with the factor of 12.5.

Operational Risk-Standardized Approach - Data Population

Figure 46: Process Flow for Operational Risk-Standardized Approach - Data Population

Operational Risk Data Population

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OR Internal LoB to Standard LoB Reclassification

⇩

OR Basel Methodology Assignment - SA

⇩

OR Annual Gross Income Calculation - Standardized Approach

⇩

OR Beta Factor Calculation

⇩

Operational Risk Entity Capital Charge Computation

⇩

Operational Risk Line of Business Capital Charge Computation

⇩

Operational RWA Calculation

⇩

Operation RISK SUMMARY POPULATION
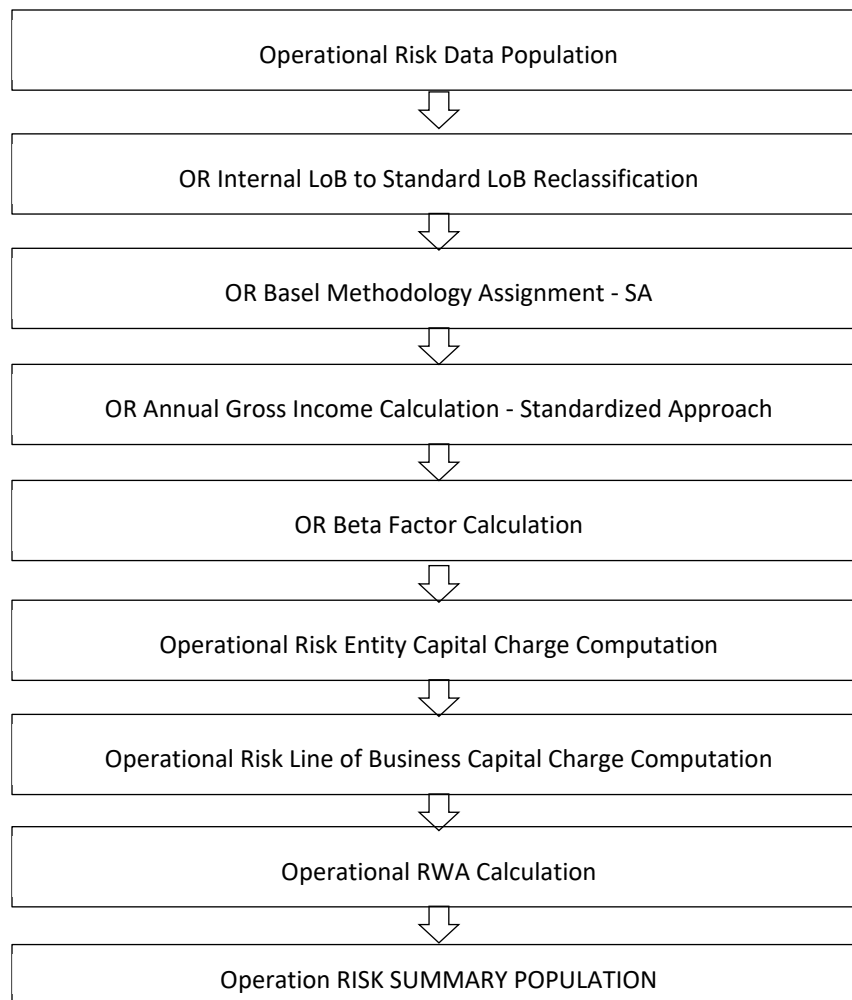
7.6.4.3 Alternative Standardized Approach

This approach is an extension of the standardized approach. In this approach for two lines of business: Retail Banking and Commercial Banking, the loan and advance amount are used (rather than annual gross income) which is multiplied by the fixed factor "m" and the beta factor.

7.6.4.3.1 Capital Charge Calculation

The capital charge is calculated by multiplying the beta value with the gross income specified for each of the LOB, for each year across each standard line of business. The average of 3 years is considered by the application, in sync with the regulatory ask. If the values of all the 3 years are not positive, then zero or the negative value from numerator and denominator is excluded.

In this approach, the beta value is a fixed value set by the regulator for each of the individual Lines of Business. They are also multiplied by the fixed factor of m. This is handled in the rule **OR_Capital_Std_App**.

7.6.4.3.2 Risk-Weight Asset Calculation

The capital charge value obtained is converted to the equivalent RWA value by multiplying with the factor of 12.5.

Operational Risk – Alternative Standardized Approach - Data Population

Figure 47: Operational Risk – Alternative Standardized Approach - Data Population

7.6.5 Key Data Elements

Key data elements that noted while calculating the capital charge for OR for the consolidated entity.

To view the complete list of tables used for Operational Risk computation, see the Download Specification document.

Entity details, which are part of regulatory consolidation and parent entity shareholding percent is required. These details are captured in the Stage Entity Shareholding Details (STG_ENTITY_SHR_HLD_PERCENT) table.

Net Interest Income, Net Provision Amount, Net Non-Interest Income, Operating Expenses, Security Sale Gain or Loss from HTM, Insurance Irregular Loss, Security Sale Gain or Loss from AFS, and Insurance Irregular Gain for each line of business, and each financial year is required.

7.7 Capital Structure

During the economic crisis, the global banking system had an insufficient level of high-level quality capital. During the crisis, it was identified that there was inconsistency in the definition of capital across jurisdictions and a lack of disclosure. To address this issue of inconsistency, the Basel committee has prescribed a new definition of capital to strengthen the global capital framework under Basel III.

Figure 48: Process Flow of Capital Structure
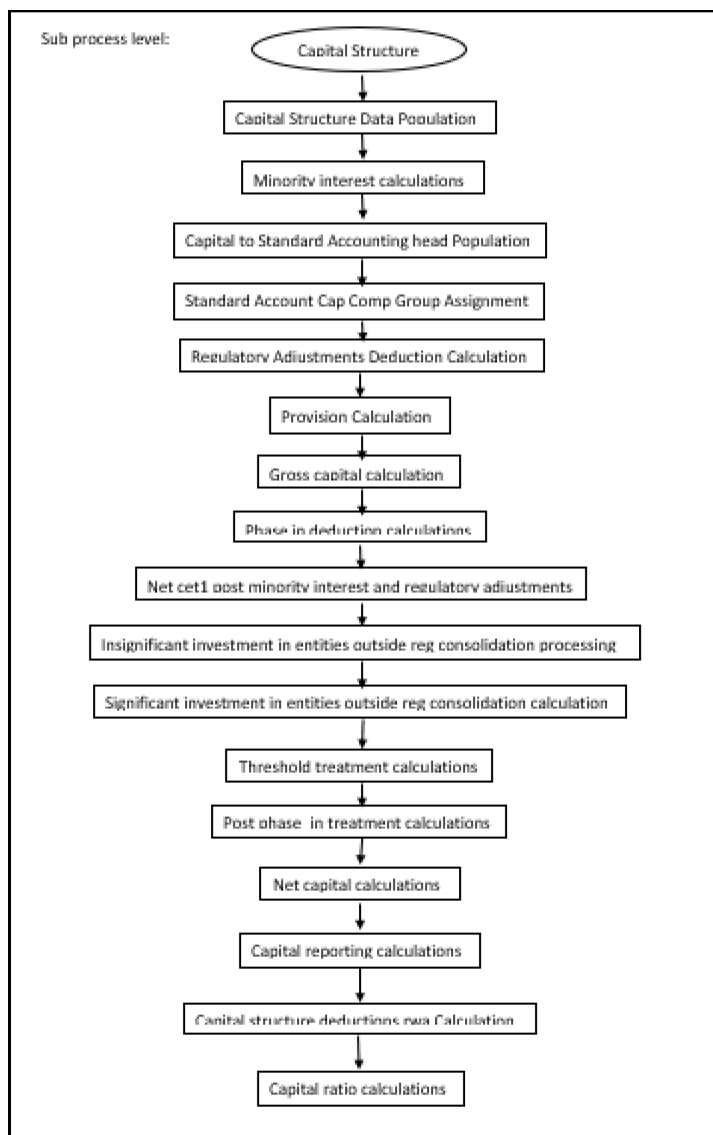
As per the new definition in the Basel III accord, total capital consists of sum of the following elements:

- Tier1 Capital, which comprises of the following components,

    - Common Equity Tier 1

    - Additional Tier 1

- Tier 2 Capital

    Each component of capital is subject to restrictions where CET1 must be at least 4.5% of the total risk-weighted asset. Tier 1 capital must be at least 6.0% of the total risk-weighted asset. The total capital must be 8.0% of the total risk-weighted asset. Each component of capital undergoes minority interest and regulatory adjustments. The minority interest is applicable for a consolidated entity only, during the consolidation run. Most of the regulatory adjustment line items are to be deducted from CET1.

    All the regulatory adjustment line items follow a phase-in arrangement from the beginning of 2014 till 2017.

    In particular, the regulatory adjustments begin at 20% of the required adjustments to Common Equity Tier 1 on 1 January 2014, 40% on 1 January 2015, 60% on 1 January 2016, 80% on 1 January 2017, and reach 100% on 1 January 2018. The same transition approach applies for all deductions from additional Tier 1 and Tier 2 capital.

    While executing Solo Run the parent entity data is processed. Investment into the subsidiary data is processed as per the Credit Risk and Market Risk Rule. The capital line item of the parent entity is only processed.

    While executing Consolidation Run, the parent entity and the subsidiary data are considered.

7.7.1 Assumption

Investments in accounting entities (which are outside the scope of regulatory consolidation) by parent bank are long-term investments and mostly equity-related instruments, hence these investments are not processed for Credit Risk Mitigation.

The GL codes are expected to be unique across entities in Stage General Ledger Data (STG_GL_DATA) and Capital Accounting Head Dimension (DIM_CAPITAL_ACCT_HEAD).

7.7.2 Data Population

Exposure level input for the capital structure flows from different stage portfolio tables.

Along with the portfolio level stage tables, the application uses the following table:

- Stage GL DATA (STG_GL_DATA)

- Stage Gl master(STG_GL_MASTER)

- Stage Party Share Holding Percentage (STG_PARTY_SHR_HLD_PERCENT)

- Stage Entity Share Holding Percentage (STG_ENTITY_SHR_HLD_PERCENT)

- Dim Organization Structure (DIM_ORG_STRUCTURE)

- Stage Standard Accounting Head (STG_STANDARD_ACCT_HEAD)

- Stage Legal Entity Details (STG_LEGAL_ENTITY_DETAILS)

- FSI_SETUP_CAPITAL_SOURCE (In this table, the application stores the CAPID details For example the capital component group or if it is eligible for transition)

- FSI_SETUP_CAPITAL_HEAD (In this table application stores all the seeded ratios as per regulatory guidelines).

7.7.3 Shareholding Percent Multiplication

Based on the share-holding percentage of the parent bank in the subsidiary and the consolidation approach to be followed for each of the entities, the Basel approach is selected.

For example: if the share-holding for an entity is 35% and is part of the consolidation process, then the approach selected for this entity is pro-rata consolidation. The reclassification is performed in the task – 'Basel III Capital Consolidation Basel Approach Type Reclassification for an Entity' in the process '**CAPITAL_CONSOLIDATION AND PARAMETER ASSIGNMENT'**.

The entity-level population is part of the SAMA Common Data Processing (PMFSAM002) process. The application updates the shareholding percentage against each entity common data in the fact capital accounting head from the fact entity shareholding percent table and updates the capital accounting head amount multiplying with the shareholding percentage of that particular entity. The parent data in the processing table of fact capital accounting head is updated with the value 1 and for each child entity, the data is based on the parent's holding percentage specified for each child in fact entity shareholding percent table.

7.7.4 Common Reclassification Rules

Certain reclassifications are specific to the capital structure process: standard accounting head reclassification, and entity type reclassification.

Capital to Standard Accounting Head Reclassification

This is the reclassification of the Capital accounting head to standard accounting head. In this, all the Capital accounting heads of the bank need to be reclassified into the Standard Accounting Head, as that is the one which is being consumed in the application. This happens in the COMMON_RECLASSIFICATION (PMFCOM005) sub-process process in Common Data Processing (PMFCOM006).

Entity Type Reclassification

The entity type reclassification is also handled as part of the Party Type reclassification since there cannot be a difference in the party type and entity type.

This occurs in the SAMA Other Reclassification (PMFSAM001) process.

Product to Capital Component Group Reclassification

This reclassification of the product to the capital component group is based on the Basel Product type, and this is handled at the individual portfolio tables of Investments and Derivatives. For investments, this occurs in the process INV_CAPITAL_STRUCTURE_RECLASSIFICATION_STD (PMFSAMINV002) and for derivatives, this happens in the DRV_RECLASSIFICATION_STD (PMFSAMDRV002) in the process.

7.7.5   Gross Capital Calculations

For Gross Capital calculation all the components are classified into their respective tiers (CET1, AT1, and T2) based on the standard accounting head, and the specifications as mentioned by the regulator. The total gross capital for each tier of capital (CET1, AT1, and T2) is calculated as per the definition of CET1, AT1, and T2 by adding the relevant financial instrument in each tier of capital. This is processed using GROSS_CAPITAL_CALCULATIONS (PMFBISCS006) sub-processes in **Capital Structure Data Processing (PMFBISCS021)** process.

7.7.6   Minority Interest Calculations

Surplus of Minority Interest

Minority Interests are calculated and the surplus amount in each tier of capital that is attributed to third parties is deducted from the gross capital of each tier of capital.

Minority interest is the amount that is attributable to any other party, which is not part of the bank's entities and has a shareholding in the entity. The surplus of minority interest is calculated as the third party's interest (shareholding percent) in the surplus capital (available capital – minimum required capital).

- All the values required for processing are populated into Minority Interest Capital (**FSI_MINORITY_INTEREST**) table which is the processing table for minority interest calculations.

- The sub-process MINORITY_INTEREST_CALCULATIONS (PMFBISCS001) in Capital Structure Data Processing (PMFBISCS021) process covers this processing.

- The minority interest is deducted from the gross capital of each tier of the capital.

7.7.7   Internal Transactions Deduction

The deduction also includes internal transactions in each tier of capital among the various entities which are part of the regulatory consolidation. This is to ensure that there is no double-counting of exposures. This is handled in the process CAPITAL_STANDARD_ACCOUNTING_POPULATION (PMFBISCS002).

7.7.8   Regulatory Adjustments & Deductions from Each Tier of Capital

All the regulatory adjustment line items are expected as a download in the Stage General Ledger Data table (STG_GL_DATA). Some of these line items are Good will, Other Intangibles, Deferred Tax Assets, Cash flow hedge reserve, and so on. The related deferred tax liabilities are also expected to be provided as a download. The application calculates the values net of DTL and then processes it for the Regulatory Adjustments. The detailed list of these line items is part of the FSI Setup Capital Source (FSI_SETUP_CAPITAL_SOURCE) table.

The sub-process REGULATORY_ADJUSTMENTS_DEDUCTION_CALCULATION (PMFBISCS004) and PROVISION_CALCULATION (PMFBISCS005) in Capital Structure Data Processing (PMFBISCS021) process handle this requirement.

7.7.9   Certain Deductions part of Corresponding Deduction Approach

There are certain deductions which are expected to be part of each of the tier of capital. And they follow the corresponding deduction approach, wherein the deduction of the line item happens in the same tier of capital to which the exposure belongs to. This is being mostly pulled from the relevant

7.7.9.1 Investment in Own Shares

The investment in own shares is calculated as the sum of the pre-mitigation EAD (EAD Pre-mitigation Measure Value (**N_EAD_PRE_MITIGATION**). The source for investment in own share is the individual portfolio table.

The source for Non-Sec exposures is FSI Cap Investment Exposures (FSI_CAP_INVESTMENT_EXPOSURES), and FSI Cap Derivative Exposures (FSI_CAP_DERIVATIVES). The process where this is being handled is Capita Structure Data Processing (PMFBISCS021).

This populates into the Fact Calc accounting head (fct_calc_acct_head). This is being populated for each of the respective tiers of capital.

The Investment in own shares is being calculated in the task INV_DRV_DEDUCTION_CALC_ACCT_HEAD_DATA_POP in the Capital Structure Data Population (PMFBISCS021) process.

This is also applicable for phase-in calculations which is being handled in the PHASE_IN_DEDUCTION_CALCULATIONS (PMFBISCS008) process.

7.7.9.2 Reciprocal Cross-holdings

The Investment in reciprocal cross-holdings are calculated as the sum of the pre-mitigation EAD (EAD Pre-mitigation Measure Value) (**N_EAD_PRE_MITIGATION**) in FSI Cap Investment Exposures (**FSI_CAP_INVESTMENT_EXPOSURES**), and FSI Cap Derivative Exposures (**FSI_CAP_DERIVATIVE**) of the exposures which have the flag of reciprocal cross-holding indicator (**F_RECIPROCAL_CROSS_HLDG_IND**) as "Y".

For this processing, the reciprocal amount is expected as a download in the Stage Capital Investments Position Table (**STG_CAP_INVESTMENTS_POSITIONS**) at an instrument level. The instrument code provided in this table is the instrument in which the reporting bank has invested, and for which there is a reciprocal cross-holding by the reporting bank. The reciprocal cross-holding amount is also captured in this table. The application expects the staging data of the exposures to have the reciprocal cross-holding indicator (**F_RECIPROCAL_CROSS_HLDG_IND**) as 'Y'.

The application uses this INV_DRV_DEDUCTION_CALC_ACCT_HEAD_DATA_POP task in the Capital Structure Data Population (**PMFBISCS021**) process to populate into the Fact Calc accounting head (**FCT_CALC_ACCT_HEAD**). This is being populated for each of the respective tiers of capital.

This is also applicable for phase-in calculations which are being handled in the PHASE_IN_DEDUCTION_CALCULATIONS (**PMFBISCS008**) process.

Finally, the adjusted amount after deductions goes back to the exposure level which is being handled in the CAPITAL_STRUCTURE_DEDUCTIONS_RWA_EXPOSURES (**PMFBISCS022**) from the process Capital Structure Data Processing (**PMFBISCS021**).

The exposure that meets the reciprocal cross-holding amount is stamped with the reciprocal cross-holding indicator (**F_RECIPROCAL_CROSS_HLDG_IND**) as 'Y'. This will be reduced in all the amount columns in FSI Cap Investment Exposures (**FSI_CAP_INVESTMENT_EXPOSURES**), and FSI Cap Derivative Exposures (**FSI_CAP_DERIVATIVES**) as per the reciprocal cross-holding ratio and store the actual amounts in FSI CAP DEDUCTION EXPOSURE table (**FSI_CAP_DEDUCTION_EXPOSURES**).

The portion of the exposure, which is above the reciprocal cross-holding amount is treated as a regular exposure and is risk-weighted as per the Basel asset class for that instrument.

7.7.9.3   Insignificant Investment

Investment in all financial entities, which are outside the scope of regulatory consolidation, is identified as significant and insignificant investments.

The shareholding percent for these parties is expected as a download in Stage Party Shareholding Percent table (**STG_PARTY_SHR_HLD_PERCENT**). Any party that is part of the Org Structure is but is not part of the regulatory consolidation can also qualify for this treatment, if it is a financial entity. If the entity is part of the Org structure, the shareholding percent is expected in the Stage Entity Shareholding percent table (**STG_ENTITY_SHR_HLD_PERCENT**).

The parties are identified as significant when the shareholding percentage is greater than or equal to 10%. And the others are identified as insignificant investments. This processing happens in the **PARTY_SHAREHOLDING_PERCENT** process.

The total investment amount in insignificant entities is computed by summing up the Pre-mitigation EAD (EAD Pre-mitigation Measure Value (N_EAD_PRE_MITIGATION)) from the portfolio tables FSI Cap Investment Exposures (FSI_CAP_INVESTMENT_EXPOSURES), and FSI Cap Derivative Exposures (FSI_CAP_DERIVATIVES). And also, the tier-wise computation of investment amount happens. The total amount is compared with the 10% of the CET1 amount of the parent bank amount post regulatory adjustments. The amount above the 10% limit is processed for the deduction.

This summing up includes direct, indirect, and synthetic investments. Indirect investments are investments in Investment funds, and which are invested in capital instruments. Synthetic investments are those investments in synthetic transactions on capital instruments. For all these exposures, the net long position amount, updated in **N_EAD_PRE_MITIGATION** is considered.

This is expected for all capital positions, and not for specific capital positions.

The total deduction amount is pro-rated among each tier of capital based on the percentage of investment in each tier of capital. The amount arrived is deducted from each tier of Capital.

The investment amount below the 10% limit is treated as per the banking book rule for the instrument.

The application computes as follows:

Parties are marked as insignificant investment parties by updating the flag: Significant Entity Indicator (**F_SIGNIFICANT_INVESTMENT_IND**) in Fact Party Shareholding Percent (**FCT_PARTY_SHR_HLD_PCT**) with value N, and **F_SIGNIFICANT_INVESTMENT_IND** in Fact Entity Info (**FCT_ENTITY_INFO**) with value N.

- The exposure amount of banking book and trading book exposures (any counterparty credit risk exposures) to these entities are summed by grouping their component of capital and compared against 10% of the parent bank's CET1 capital. The portion of the amount which exceeds the 10% limit is deducted.

- This is computed by calculating tier-wise deduction percentage and multiplying this percentage with the exposure amount to arrive at the amount to be deducted from each tier of capital.

- The total investment values are populated into the Non-Regulatory Consolidation Entity Investment (**FSI_NON_REG_CONSL_ENTITY_INVST**) table which is the processing table for insignificant and significant investment deductions.

- The sub process INSIGNIFICANT_INVESTMENT_IN_ENTITIES_OUTSIDE_REG_CONSOLIDATION_PROCESSING (PMFBISCS010) in Capital Structure Data Processing (PMFBISCS021) covers the processing.

- After the application of this treatment, the Insignificant Investments line item also follows a phase-in arrangement which is similar to the phase-in arrangement for Regulatory Adjustments.

7.7.9.4   Significant Investment

The total investment amount is checked against the set limit of 10% of the CET1 amount of the parent bank, post insignificant investment amount adjustment. The CET1 amount above 10% is deducted from the CET1 post insignificant investment amount deduction. The CET1 amount below 10% follows the threshold deduction. The investment amount in AT1 and T2 is fully deducted from its respective AT1 and T2 tier of capital. The application computes as follows:

Entities are marked as significant investment entities by updating the flag – Significant Entity Indicator (**F_SIGNIFICANT_INVESTMENT_IND**) in Fact Party Shareholding Percent (**FCT_PARTY_SHR_HLD_PCT**) with value Y and Significant Entity Indicator (**F_SIGNIFICANT_INVESTMENT_IND**) in Fact Entity Information (**FCT_ENTITY_INFO**) with value 'Y'.

The exposure amount of banking book and trading book exposures (any counterparty credit risk exposures) to these entities are summed by grouping their component of capital and compared against 10% of the parent bank's CET1 capital. The portion of the amount which exceeds the 10% limit is deducted from CET1. The exposures of AT1 and T2 are fully deducted from the respective tier of capital. This is performed by calculating the deduction percentage for CET1 and by multiplying this percentage with the CET1 exposure's exposure amount to arrive at the amount to be deducted from CET1 capital.

The sub process – SIGNIFICANT_INVESTMENT_IN_ENTITIES_OUTSIDE_REG_CONSOLIDATION_PROCESSING (PMFBISCS011) in Capital Structure Data Processing (PMFBISCS021) covers the processing.

After the application of this treatment, the Significant Investments line item also follows phase-in arrangement which is similar to the phase-in arrangement for Regulatory Adjustments.

7.7.10   Threshold Deduction Treatment

Threshold Deduction is populated in the **FSI_THRESHOLD_TREATMENT** table and the threshold calculations are processed in this table

The line items, (Significant and insignificant Investment in the Common Shares of Accounting entities are populated from the FSI NON REGULATORY CONSOL ENTITY INVESTMENT table (FSI_NON_REG_CONSL_ENTITY_INVST), Mortgage Servicing Rights net of Deferred Tax Liabilities are populated from the Fact Standard Accounting head (FCT_STANDARD_ACCT_HEAD) table, and DTAs that arises from temporary differences are populated from the Fact Capital Accounting Head (FCT_CAPITAL_ACCT_HEAD).

The three-line items' significant investment in the common shares of BFSI where the bank owns more than 10%, Mortgage Servicing Rights (MSR), and DTAs that arises from temporary differences are processed for threshold deduction are populated in the Capital Threshold Treatment (**FSI_THRESHOLD_TREATMENT**) table and the threshold calculations are processed in this table. These three-line items are individually compared with the 10% of CET1 calculated Post Regulatory Adjustments, Insignificant Investments, and Significant Investment. The amounts which are above the 10% CET1 limit are deducted from CET1 following the phase-in arrangements. During the transition period, any amount of these three-line items, which is not deducted as per the 10% mentioned earlier, is summed up for the aggregate 15% limit check. During the transition period, the check of 15% is against the CET1 post all regulatory adjustments and adjustments to insignificant investments and significant investments and the individual threshold deduction. In the post-transition period, instead of 15%, the aggregate check is 17.65%

of CET1, post all regulatory adjustments and adjustments to insignificant investments, less 100% of the sum of the line items which goes for threshold deduction.

The amount which is not deducted due to this 10% and 15% check is risk-weighted 250% during the transition period and is risk-weighted 250% post the transition period. The entire processing is performed in the sub-process – 'THRESHOLD_TREATMENT_CALCULATIONS (PMFBISCS012) in Capital Structure Data Processing (PMFBISCS021).

7.7.11   Net Capital Calculations

The net CET1, net AT1, and net T2 capital amounts are calculated to post all regulatory adjustments. Any shortfall in T2 capital amount is adjusted against Net AT1 amount and any shortfall of AT1 capital amount is adjusted against Net CET1 amount.

This is performed in sub-process NET_CAPITAL_CALCULATIONS (PMFBISCS014) in Capital Structure Data Processing (PMFBISCS021)

For RWA, RWA_POPULATIONS (PMFBISCS016) in Capital Structure Data Processing (PMFBISCS021).

For net capital, it is NET_CAPITAL_CALCULATIONS (PMFBISCS014) in Capital Structure Data Processing (PMFBISCS021).

7.7.11.1   Total RWA Calculations

The RWA amount for Credit Risk - Non-Securitization, Counterparty Credit Risk, Credit Valuation Adjustment Risk-Weighted Asset, Credit Risk - Securitization, Market Risk, and Operational Risk and Regulatory Capital Phase in Related RWA are calculated by summing up the RWA amount.

The Phase-In RWA captures the capital instrument investments that go for deduction from Capital but because of Phase-In arrangement are to be risk-weighted such as – Reciprocal Cross-holding, Treasury Stock, Insignificant Investment amount, Significant Investment amount, and Threshold deduction amount.

These are reported under different Capital accounting heads such as 'Risk-weighted Asset amount for Standardized Portfolios/IRB portfolio' for Non-Securitization, "Sec Std RWA" for Securitization portfolio, "Market RWA" for Market Risk and "Operational RWA" for Operational Risk.

This is part of the RWA_POPULATIONS (PMFBISCS016) in Capital Structure Data Processing (PMFBISCS021).

7.7.11.2   Capital Ratio Calculations

Tier 1 capital ratio and capital adequacy ratio are calculated using the total RWA amount, net Tier 1 capital, and Total capital amount.

For capital ratio, the process is CAPITAL_RATIO_CALCULATIONS (PMFBISCS017) in Capital Structure Data Processing (PMFBISCS021).

7.7.11.3   Required Capital ratio

This process is handled in CAPITAL_RATIO_CALCULATIONS (PMFBISCS017).

In this, the application calculates the CET1 capital ratio, T1 capital ratio, T2 capital ratio, and a total capital ratio summing all of them.

This sum is compared with the required capital ratio provided as an input for the specific regulator. The required capital ratio is being provided as an input in the FSI Setup Capital Accounting Head (FSI_SETUP_CAPITAL_HEAD).

7.7.11.4 Deficit or Excess Capital

The shortfall is handled in the sub-process Net capital calculations (PMFBISCS014),

Here the application calculates CET1, AT1, and T2 capital shortfall amounts.

7.7.11.5 Key Data Elements

Key data elements to process the Capital Structure for the consolidated entity are as follows. For a complete list of tables and columns to be updated, see the Download Specifications document.

Entity details are part of regulatory consolidation and parent entity shareholding percent. This data is captured in Stage Entity Shareholding Details (STG_ENTITY_SHR_HLD_PERCENT) table.

The capital structure component for each tier of capital for all entities involved in regulatory consolidation.

The total RWA, total CET1, AT1, and T2 amount, and third-party percentage of holdings in each tier of capital for minority interest calculation.

The regulatory adjustment amount like goodwill, DTA, other intangible assets, cash flow hedge reserve, and defined pension fund asset, MSR, and so on.

The transaction of the investment amount for an accounting entity that is outside the scope of regulatory consolidation.

The CET1, AT1, and T2 capital of the entity which has third-party minority holdings in it are expected as a download in the legal entity details (STG_LEGAL_ENTITY_DETAILS) table. Similarly, the third-party investment in each tier of capital is also expected as a download in the legal entity details table.

The minimum required capital for each tier for each capital adequacy regulator (for the entity that has a third-party minority holding in it) is expected in the setup table - Setup Capital Heads (FSI_SETUP_CAPITAL_HEAD).

The Total RWA (CAP838) for the entity that has a third-party minority holding in it is a download value in Stage Standard Accounting Head (STG_STANDARD_ACCT_HEAD).

7.7.11.6 Limitations

The limitations in the release of OFSCAP 8.1.0.0 is as follows:

- **Investment in Own Shares Treatment**

  The investment in own shares which goes for capital treatment has a phase-in treatment, wherein during phase-in, a portion of the exposure goes for deduction from the capital, and the remaining portion of the exposure goes for 100% RW. This is handled in the processing by the Phase-In treatment table, and this RW gets added into the Regulatory RWA Accounting Head.

  But for reporting, the reporting happens from an account level granularity, and not at a higher granularity of the accounting head. As the current application does not split the exposures into two in the processing portfolio tables, the account level and the Phase-In treatment table values do not reconcile with each other. Currently, this must be specifically addressed in the reporting layer and is not part of the OOB product.

7.8   Capital Buffers

Capital Buffer is calculated after the calculation of Capital Ratios, as they go as an input to Buffer calculation. Each sub-process is explained in detail under the Capital Buffer section of the user guide.

For example, the Required Capital Conservation Buffer and Required Countercyclical Buffer calculation are detailed in the 'Required Total Buffer' sub-section of the Capital Buffer section in this document. Similarly, the Minimum Capital Conservation ratio is detailed in the 'Capital Conservation Ratio' sub-section of the Capital Buffer section in this document.

Figure 49: Process Flow for Capital Buffers
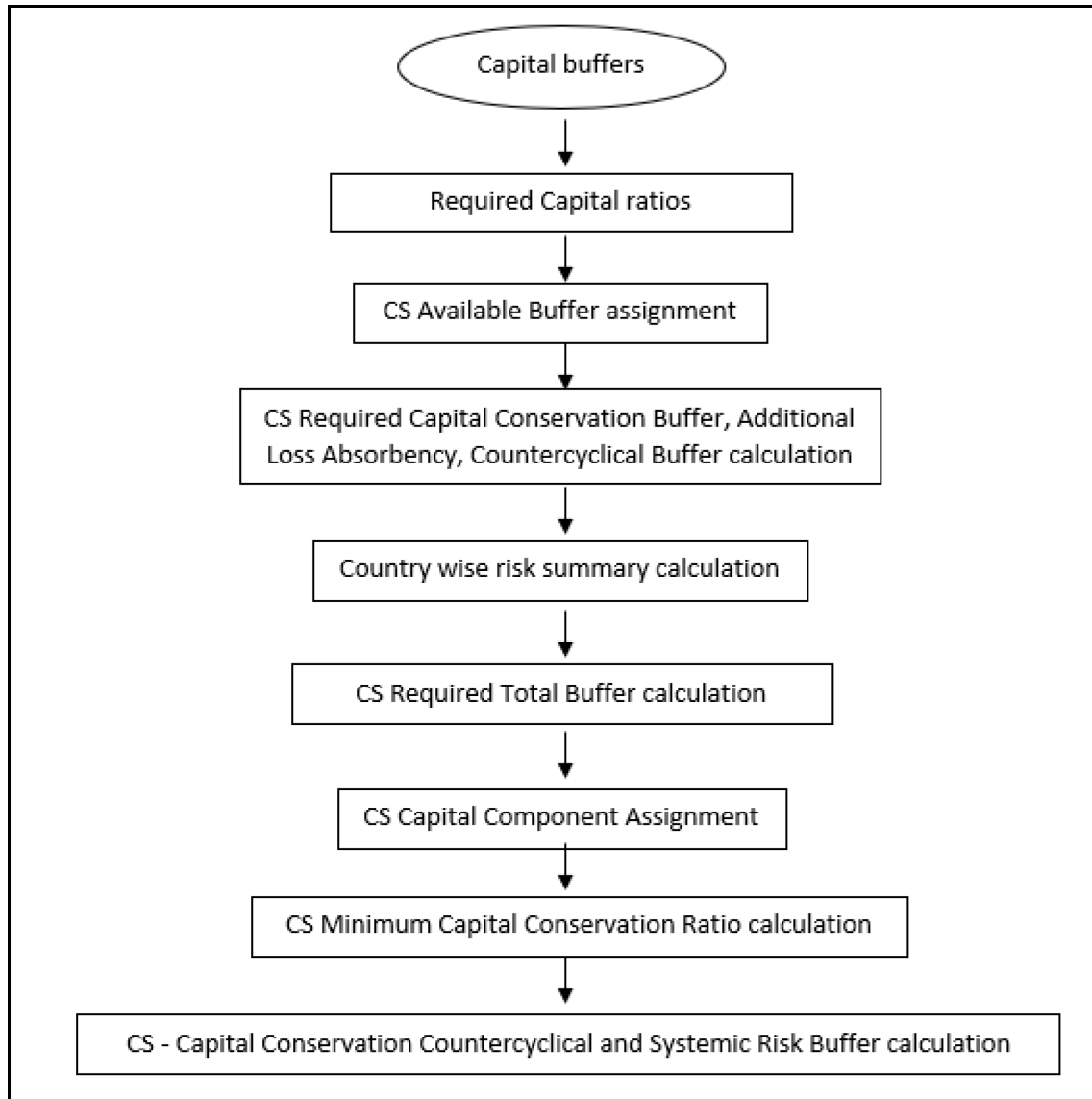
7.8.1   Data Population

The major input for capital buffers is the total capital ratio and the Net Common Equity Tier 1 Capital Ratio s which gets computed as part of the capital structure process. This is consumed from the fact standard the accounting head.

Along with that, the application consumes additional data related to buffers from the Stage Countrywide Risk Summary (STG_COUNTRYWISE_RISK_SUMMARY) which is used to populate country-wise risk summary.

FSI Benchmark Capital Conservation Ratio (FSI_BENCHMARK_CAP_CONS_RATIO) and FSI Benchmark Countercyclical Buffer (FSI_BENCHMARK_CNTR_CYC_BUFFER).

7.8.2   Buffer Requirements

The following are the different types of Capital that the banks are expected to maintain:

- Capital Conservation Buffer

- Countercyclical Buffer

- Additional Loss Absorbency Capital (for G-SIB)

A detailed description of each of these buffers is provided in the following sections.

7.8.2.1   Capital Conservation buffer

As part of the Basel III compliance, requires banks are required to maintain Capital Conservation Buffer (CCB) out of Common Equity Tier 1 Capital (CET1).

This buffer is used to ensure that any loss should not erode the bank's capital, and hence it is expected to be met over and above the Required CET1 Capital. The actual required ratio for the jurisdiction is being specified in the FSI Setup Capital Head (FSI_SETUP_CAPITAL_HEAD).

7.8.2.2   Countercyclical Buffer

As part of the Basel III compliance, banks are required to maintain a Countercyclical Buffer that is prescribed by the respective jurisdiction's regulator through an extension of the Capital Conservation Buffer.

The application calculates the buffer requirement for internationally active banks as the weighted average of the buffers required across all the jurisdictions to which the bank has exposures, weighted on basis of the exposure amount to different countries of the counterparty of their exposures.

If the guarantor and credit default swap is present for exposure, then the application considers the domicile country of these mitigants for the covered portion and the country of the exposure counterparty for the uncovered portion. After calculating the weighted average, the application then computes a single value for Countercyclical Buffer benchmark which is applicable on all exposures of all jurisdictions.

7.8.2.3   Additional Loss Absorbency Buffer (GSIB Buffer)

If a banking organization is categorized as a Globally–Systematically Important Banks (G-SIB), then the application identifies all subsidiaries in various jurisdictions as G-SIB as well. Based on this assessment, banks are assigned a GSIB score and the applicable bucket is decided. Identification of this bucket is based on the score as per the guidelines. Loss absorbency is required to be met as an extension of Capital Conservation and Countercyclical for a computational buffer for computational purposes.

7.8.3   Required Buffers

Required Total Buffer (CAP825) is the sum of the three buffers: (CAP829) Required Buffer from CET1 Capital, (CAP830) Required Buffer from Tier 1 Capital, (CAP831) Required Buffer from Capital Adequacy Ratio.

The calculated values (only positive values are considered) are stored against the corresponding Cap IDs as two separate line items of which one is 0.

The Required buffers as a percentage are provided as a download in the FSI Setup Capital Account Head (FSI_SETUP_CAPITAL_ACCCT_HEAD) as per the specific regulatory need. This is being multiplied by the Total RWA to arrive at the Required Buffer as an amount.

7.8.4   Assumptions

Countercyclical Buffer requirement for each country must be provided by the client or the bank as the final percentage applicable for each country and this is dependent on the home regulator. G-SIB status and applicable bucket information for each entity must also be provided by the client/bank.

For Required Weighted Average Countercyclical Buffer calculation, the exposures used in the bank are all accounts exposed to credit risk (Securitized and Non-Securitized) and those exposed to Market Risk. However, the application can be restructured to consider only those exposed to Credit Risk.

In Capital Conservation Ratio, for the computation of the quartiles that are used to arrive at Minimum Capital Conservation Ratio, the application is dependent on the required CCB ratio. From 2013 till 2016, CCB requirements keep changing every year as per the transitional arrangement, to calculate the quartiles range, the application considers it as per the transitional arrangement. At the same time, the application has the flexibility to have the required CCB constant at 2.5% throughout. Also, the minimum required CET1 Ratio considered for building these quartiles is 4.5%

7.8.5   Key Data Elements

Key data elements are elaborated in this section. For a complete list of tables to be updated, see the Download Specifications document.

Countercyclical Buffer requirements for each country must be provided by the client or the bank as the percentage applicable for each country is dependent on the home regulator's jurisdiction. The home regulator's jurisdiction can prescribe a Countercyclical Buffer percentage that is higher than the percentage prescribed by the regulator of exposure country. Hence, the required Countercyclical Buffer percentage for each exposure country provided as input must be the one that the home regulator agrees to.

G-SIB status and applicable bucket information for each entity must be provided by the client or the bank. In the case of a consolidated Run, loss absorbency charges applicable to the parent, as required by the regulator of the parent required to the complete Run. This Run output is supposed to be reported to the jurisdictional regulator of the parent. For a Solo Run, loss absorbency charges as required by the regulator for a subsidiary entity are applicable. Hence, for Solo and Consolidated Runs, the G-SIB status of the reporting bank, and the applicable bucket are provided by the bank itself.

As the required Capital Conservation Buffer (CCB) must be met as per the transitional arrangement, therefore the required buffer value must be set up in Setup Capital Heads (**FSI_SETUP_CAPITAL_HEAD**) table for different periods against the standard account head ID CAP823. Different CCB requirements specified by the different regulators can be set up by specifying the regulator codes against the same

standard account head ID. This regulator code must be the same as the jurisdiction code assigned by the Rule Jurisdiction Code Assignment.

The required benchmark of Countercyclical Buffer for different countries as set by different regulators is expected as a download in Stage Benchmark Counter-Cyclical Buffer (**STG_BENCHMARK_CNTR_CYC_BUFFER**). This data is populated to Benchmark Counter-Cyclical Buffer Ratio (**FSI_BENCHMARK_CNTR_CYC_BUFFER**) using a Slowly Changing Dimension (SCD) process. Buffer requirement given on a date is valid till the next buffer is specified. For a solo Run, the regulator of subsidiary specified buffer requirements are considered, and for a consolidation Run, the consolidating entity's regulator specified buffer requirements are considered.

The Additional Loss Absorbency requirement specified by different regulators for different buckets must be set up in the table Benchmark Loss Absorbency Ratio (**FSI_SETUP_BENCHMARK_LOSS_ABS**). For the solo Run, the loss absorbency requirement set by the local regulator is considered. For consolidation Run, the consolidating entity's regulator specified loss absorbency requirement is considered.

There is an option to directly input the applicable loss absorbency percentage. This is also useful when the percentage applied is different from the corresponding bucket percentage. This must be provided in the column **N_LOSS_ABS_OVERRIDE** of the table Stage Legal Entity Details (**STG_LEGAL_ENTITY_DETAILS**). If this column has a value, it is given priority over the loss absorbency percentage corresponding to the bucket.

The minimum Capital Conservation Ratios requirement for different quartiles (1, 0.8, 0.6, 0.4, 0) is expected as a download in Stage Benchmark Capital Conservation Ratio (**STG_BENCHMARK_CAP_CONS_RATIO**). This data is populated to the semi-static table Benchmark Capital Conservation Ratio (**FSI_BENCHMARK_CAP_CONS_RATIO**) using the SCD process. Conservation ratios specified once are valid till the next revision.

In the **FSI_REQUIRED_CNTR_CYC_BUFFER** table, the post-mitigation exposure amount is updated against each country code. This is applicable for Credit Risk (for Non-Securitization and Securitization exposures) and Market Risk.

7.9 Large Exposures

The large exposure framework is a framework detailing how the banks need to manage their exposures to various parties both at an individual level as well as to the group of connected clients' level.

The large exposure framework must comply with the bank at both solo and consolidated levels. As part of the solo execution, the bank has to identify its large exposures and comply with the required threshold limit.

As part of the consolidation execution, the bank has to identify the total large exposures at the consolidated level and comply with the required threshold limit.

The solo and consolidation are as per the regulatory definitions and same as the one which is being used for the regular capital adequacy.

The large exposures are identified based on the comparison of the total individual party's exposures to the Tier 1 Capital, which changes based on whether it is a solo execution or consolidation execution.

7.9.1 Data Population

The large exposure computations require data related to the various portfolio: banking, investment, derivatives, securities and financing transactions, and trading book exposures.

Non Securitization Data Population

Data must be loaded in the application for all the product types and is the same as Capital Adequacy-related data expectation.

See the individual portfolio for the data elements:

- Banking

- Investment

- Derivatives

- Securities Financing transactions

Mitigant Data Population

The data relating to the mitigants associated with the exposures are captured in this process. This is also the same as the regular capital adequacy run related data.

For more information about Mitigant Data Population, see the Mitigant Processing section.

Securitization Data Population

Data must be loaded in the application for all the relevant Securitization tables and is the same as Capital Adequacy related data expectation.

For more information about the securitization data population, see the Securitization Data Population section.

Trading book Data Population

Data must be loaded in the application for all the trading book exposures and is the same as Capital Adequacy related data expectation.

For more information, see Market Risk Data Population.

All these data are populated into the processing table of **FSI_LARGE_EXPOSURE_ACCT_DETAIL**.

Large exposure data population is handled in the sub-process **LARGE_EXPOSURE_DATA_POPULATION**

7.9.2   Reclassification

The reclassification rules are the same as the ones already detailed in the following individual portfolios:

- Banking

- Investment

- Derivatives

- Securities Financing transactions

In addition to the above, the reclassification which is specific to large exposures is the one mentioned below.

7.9.2.1   Party Relationship reclassification

All the relationships at the party level are expected in the stage party–party relationship table (**STG_PARTY_PARTY_RELATIONSHIP**)

The Large Exposures computation require the details of the party's relationship to one another, since there are different limitation to the group exposure (which will be a group of connected counterparties based on various relationship types), and to individual counterparties (without considering any other related counterparties).

From a definition perspective, connected counterparties are individual entities that are considered as a group due to the direct or indirect control established between entities. This direct or indirect control is being identified based on the party-party relationship table wherein every related party's information is provided, and the relationship type is also defined.

This is reclassified into the standard relationship type, to be used for further processing and reporting.

7.9.3 Computation of the Direct Exposures

The direct exposures are the actual exposures that are in the bank's portfolio in the form of banking, derivatives, and SFT exposures. In the case of an investment portfolio, the direct exposures are the ones that are investments in the form of debt securities or equity and which do not have any underlying dependencies. This is handled for individual counterparties.

This gets handled as part of the sub-process **BIS_LARGE_EXPOSURE_EAD_ASSIGNMENT** in the process **LARGE_EXPOSURE_DATA_PROCESSING**.

7.9.4 Computation of Indirect Exposures

The indirect exposures are the mitigants that have been provided to the exposures in the bank's portfolio in the form of banking, derivatives, investment, and SFT exposures. This is handled for individual counterparties.

This gets handled as part of the sub-process **BIS_LARGE_EXPOSURE_EAD_ASSIGNMENT** under the process **LARGE_EXPOSURE_DATA_PROCESSING**.

7.9.5 Computation of Synthetic Exposures

The synthetic exposures are the ones related to Securitization and CIU wherein there are synthetic exposures to the underlying of these transactions.

In this scenario, these exposures are computed by assigning them to the unknown clients or the actual counterparty to whom the underlying belongs depending on data availability.

This is handled for individual counterparties.

The computation of gross credit exposure for CIU/SPV is handled in the process **LARGE_EXP_SPV_UNDERLYING_PROCESSING**

7.9.6 Exempted Exposures

Certain exposures are being exempted from the large exposure calculations. These are mostly as specified by the regulator, and include the cleared transactions, and other exposures that are deducted from capital, since it does not make sense to consider them in the large exposure calculations.

This is handled for individual counterparties.

The computations concerning this are handled in the subprocess **BIS_LARGE_EXPOSURE_EXEMPTIONS** of the process **LARGE_EXPOSURE_DATA_PROCESSING.**

7.9.7　Calculation of Total Exposure to a counterparty

Calculation of gross credit exposure depends on the specific product category of the on-balance sheet, off-balance sheet exposure, derivative products, secured lending and borrowings, exposures arising from CIU, exposures arising from SPVs along with the exposures to third parties of the SPVs, and trade exposures. The calculation also covers indirect exposures of the counterparty arising out of the mitigant exposures of the bank.

This is applicable for all the counterparties for which the bank has exposures in the form of either direct, indirect, or synthetic exposures. This is handled in the sub-process **LARGE_EXPOSURE_COUNTERPARTY_POPULATION** and **BIS_LARGE_EXPOSURE_COUNTERPARTY_PROCESSING** in the process **LARGE_EXPOSURE_DATA_PROCESSING**.

7.9.8　Identification of Related Parties

It is expected that the party ID is the one for which it is considered as a related party. For example, if Bank A is related to party B, and party B is related to party C, it is expected that the data is provided for Bank A to party B, and Bank A to party C, to ensure that every mapping is being considered.

The solution sums up the exposures for all the counterparties belonging to the same parent, along with the parent, and populates the FSI Large Exposure Account Detail Table (**FSI_LARGE_EXPOSURE_ACCT_DETAIL**).

The expectation is that all the parties which are related to each other, have the Parent ID of the Party table as the same, or are part of the related party. Based on these related parties identified, and the parent id in the DIM_PARTY, the related parties are identified, and these are also considered as belonging to the same group.

This is handled in the sub-processes **LARGE_EXP_PARTY_GROUP_MEMBER_MAPPING** and **LARGE_EXP_PARTY_GROUP_EXP_POPULATION** in the process **LARGE_EXPOSURE_DATA_PROCESSING.**

On the party group, the threshold limit check is applied, and large exposures are identified.

7.9.9　Calculation of Total Exposure to a group of related counterparties

All the total exposures of the parties will be clubbed together to calculate the total party group exposures. This will be based on the related parties identified. This is the total exposure based on which the large exposure identification happens, and also the breach condition check happens.

This is handled in the sub-process **BIS_PARTY_GROUP_LARGE_EXP_PROCESSING** in the process **LARGE_EXPOSURE_DATA_PROCESSING.**

7.9.10　Total Capital of the Bank

This is used to calculate the total capital of the bank. This is computed as per the Capital Structure related calculations.

This is handled in the sub-process **LARGE_EXPOSURE_CAPITAL AMOUNTS_POPULATION** in the process **LARGE_EXPOSURE_DATA_PROCESSING**.

7.9.11   Identification of Large Exposure Counterparties

The large exposures are identified based on whether the group exposure of the counterparties exceeds the required threshold using the pre mitigation value.

This is handled in the sub-process **BIS_PARTY_GROUP_LARGE_EXP_PROCESSING** in the process **LARGE_EXPOSURE_DATA_PROCESSING.**

7.9.12   Threshold criteria for Large Exposure Counterparties

The regulator indicates the threshold criterion below which the large exposures can be maintained by the bank. This threshold percent is assigned based on the standard party type of the counterparty, as specified by the regulator.

This is handled in the sub-process **Large Exposures Counterparty Threshold Amount Calculation** in the process **BIS_LARGE_EXPOSURE_COUNTERPARTY_PROCESSING.**

7.9.13   Large Exposure Breach Calculations

The application identifies whether there has been any breach to the large exposure threshold as specified by the regulator and is stamped a flag indicating that the counterparty as a group has breached it.

This is handled in the sub-process **Large Exposures Counterparty Threshold Limit Breach Indicator Assignment** in the process **BIS_LARGE_EXPOSURE_COUNTERPARTY_PROCESSING.**

7.10   Leverage Ratio

During the financial crisis, banking institutions built up excessive on-balance sheet and off-balance sheet leverage which forced the banking sector to reduce its leverage. To prevent the building of excessive leverage on the institutions' balance sheet, the BIS has introduced a non-risk-based leverage ratio which is a new regulatory tool supplementing risk-based capital requirement. The leverage ratio guidelines were revised and published on 10th October 2014. The guidelines are mostly in sync with the revised leverage ratio guidelines issued in 2014 by BIS.

The solution supports this revised approach in the calculation. The application calculates the leverage ratio for a reporting bank. The minimum required leverage ratio is 3%.

The leverage ratio is calculated by dividing an institution's Tier 1 capital measure by the total leverage exposure measure.

$$\textbf{Leverage Ratio} = \frac{\textbf{Tier 1 Capital}}{\textbf{Leverage Exposure Measure}}$$

The Run Basel III Revised Leverage Ratio Calculation is used for computing the leverage ratio, as per the revised guidelines.

Net Tier 1 capital is the summation of Net CET1 and Net AT1 capital amount post regulatory adjustment. Exposure measure is the summation of on-balance sheet items, off-balance sheet items, Derivative Exposures, and Structured Financial Transactions (SFT). The on-balance sheet items include the Non-Securitization exposures' amount and the Securitization exposures' amount. The off-balance sheet items include the Non-Securitization exposures' amount and the Securitization exposures' amount. Mitigation is not considered when calculating exposure amount.

The leverage calculation happens at the consolidated parent entity level. The market risk data are not captured for the EU Jurisdiction, and hence that is expected as a download. This is expected in Stage Standard Account Head (**STG_STANDARD_ACCT_HEAD**) for the CAP843 (Leverage Ratio).

The leverage ratio calculations are a separate run and not part of the regular capital calculation run. This is because of the changes in the Credit conversion factor assigned to the exposures, and also the exemption of few exposures from the calculation that are part of the capital charge calculations. Also, mitigation is not required for these exposures, and the exposure measure calculations are different from the regular EAD calculations.

The accord is not explicit on the inclusion of Securitization and market-related transactions in the exposure measure calculations. However, the application has considered Securitization and the market-related transactions in the calculation of total leverage exposure measure.

As the application does not support market-related capital calculations related to the BIS jurisdiction, the application expects the MR-related Exposure measure as a download.

Figure 50: Process Flow for Leverage Ratio
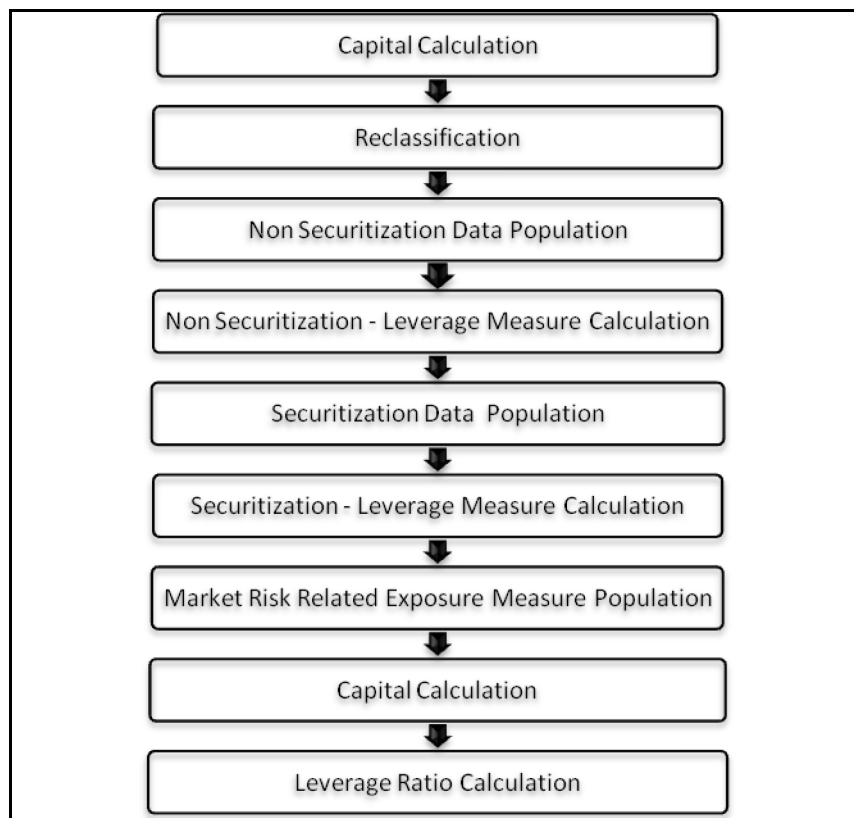
7.10.1   Data Population

Non Securitization Exposure Data Population

Data from the Product Processors are populated to the **FCT_NON_SEC_EXPOSURES** table in the process **NON_SEC_DATA_POPULATION**. This data population also remains the same as existing in the capital calculation run.

Collateral of Derivative

Collateral for the derivatives, which is already considered in the MTM calculation, are provided in the STG_MITIGANTS table with the eligibility flag as 'N' and the corresponding entry is added into the STG_EXP_MITIGANT_MAPPINGS table.

The MTM provided for the derivatives' instruments, must be after following the corresponding operational accounting framework.

Securitization Data Population

Securitization exposure data is populated to the securitization processing table in the process Securitization Data Population (SEC_DATA_POPULATION). The population remains the same as in the capital calculation run.

Key Data Elements

Key data elements are elaborated in this section. For a complete list of tables and columns to be populated, see the Download Specifications document.

To calculate the leverage ratio, the exposure amount for all product types and the total capital is required.

The key data elements for exposure measure calculation of the various product types are as follows:

- On-Balance Sheet Exposures: For on-balance sheet items, End of Period (EOP) balance amount, write-off, and accrued interest amount are required.

- SFT Exposures: For repo products, exposure amount, and instrument rating are required.

- Derivative Exposures: For derivative products, exposure mark to market value, notional principal amount, and underlying instrument types are required.

- Off-Balance Sheet Exposures: For off-balance sheet items, an undrawn amount is required.

- Securitization Transaction: For securitization transactions, an exposure amount is required.

- Capital Calculation: See the Capital Structure for more details.

- Cash Variation Margin: The collateral segregated flag, exchange-traded flag, and netting agreement code are required.

- Netting Agreement: The margin threshold and the minimum transfer amount are required, which are captured in the Stage Net Exposures table (STG_NET_EXPOSURES).

7.10.2   Exposure Measure Calculations

- After data is populated in the Non-Sec processing table, the exposure measure is calculated in the process **Total Leverage Exposure Amount Calculation**.

- The Exposure measure is the sum of the Pre-mitigation EAD amount of the following exposure types:

- On-Balance Sheet Exposures

- Off-Balance Sheet Exposures

- SFT Exposures

- Derivative Exposures

- Details on the calculation of these exposure measures are mentioned in the following sections. All the exposure measures are computed and populated into the Leverage Exposure amount (**N_LEVERAGE_EXPOSURE_AMOUNT**) column. And any exempted exposures are identified by the solution in the Regulatory Capital Exemption Criteria in the Non-Sec Exposures processing table. These exempted criteria are part of the dimension table of Regulatory Capital Exemption Criteria Dimension (**DIM_REG_CAP_EXEMPTION_CRITERIA**).

7.10.2.1   On Balance Sheet Exposures

- The accounting value of the on-balance sheet exposures net of specific provisions and valuation adjustments are considered for the exposure measure. The valuation adjustments are captured at an instrument level, in the FSI setup table for Instrument Valuation Details (FSI_SETUP_INSTR_VALUATION_DTLS).

- The exposure measure considered is the Pre-Mitigation amount and does not consider the benefit of the mitigation.

- Some of the exempted exposures are detailed as follows.

- **Fiduciary Assets**

- If the bank considers the assets of the fiduciary assets as the bank's assets, then these assets are exempted from the calculation. The fiduciary assets are identified based on the exposures having the Parent Fiduciary Account Number (V_PARENT_FIDUCIARY_ACCT_NUMBER) in the product processor (PP) staging tables.

- The bank has to select the run management option to select whether the exposures are derecognized in the balance sheet or not. If the run management option of Y is selected, all the fiduciary assets with the parent fiduciary account are exempted from the Leverage Exposure Measure calculations. If the run management option of N is selected, specific fiduciary assets can be exempted from the Leverage Exposure Measure calculations. These specific fiduciary assets are expected to be provided in the FSI Fiduciary Assets setup table (FSI_SETUP_DEREC_FIDUCIARY_ASST).

- This is handled in the **Fiduciary Assets Exemption** sub-process of the **LR Exemptions in Credit Risk of Invested Exposures** process.

7.10.2.2   Off Balance sheet exposures

The exposure amount for off-balance sheet exposures is the undrawn amount of the exposure multiplied by the CCF. The CCF of the exposures remain the same as in the Capital Calculation Run, except that the CCF is floored at 10%. The flooring of the CCF to 10% is handled by the rule LR Credit Risk Exposure Measure Calculation in the LR - CCF Flooring for Credit Risk Exposure Amount sub-process. This exposure measure does not consider the mitigation effect.

7.10.2.3   Derivative Exposures

Derivative transactions (OTC Derivatives) exposure measures are calculated using the Mark to Market Method. The add-on assignment is the same as what is mentioned in the Capital Calculation Run. The exposure measure is the sum of market value, and the notional amount multiplied by the add-on percent.

The derivative exposure measure has few specific treatment, in terms of the Leverage Exposure Measure calculations. They are as detailed as follows.

Collateral of Derivative

The collateral received concerning the derivatives cannot be used in netting and reducing the exposure amount of the derivatives. Based on whether the operative accounting framework allows for the netting of the collateral or not, the solution updates the exposure measure. The solution expects a run management selection to identify whether the bank considers netting of the collateral outside the application, and provides the netted amount as input to the product processor staging tables.

The collateral of the derivative is provided in the mitigant table. There is a run management option to capture whether the operative accounting framework allows for the netting of the collateral as per the master netting agreement or not.

If 'Yes' is selected, assuming that the bank has provided the MTM value based on already considering the collateral amount, the collateral amount is added to the MTM of the exposure. And if 'No' is selected, there is no change to the MTM value.

7.10.2.4 SFT Exposures

The exposure amount of the SFT Exposures to be considered for the leverage measure is post the effect of the collateral. The SFT Exposures data provided in the staging must not consider the accounting netting.

The data capture for the SFT exposures remains the same as in the Capital calculation run. The bank role in the SFT transaction is also captured in the staging table.

The Gross amount and the Add-on amount, as expected in the accord are computed by the application. The Gross amount is the actual transaction amount of the SFT exposures, as provided in the Repo contracts staging table. And the Add-on amount is the difference between the fair value of the repo exposures and the fair value of the collateral placed or received.

- The fair value of the exposures, including the placed collateral are captured at an instrument level, in the FSI setup table for Exposure Fair Value Details (**FSI_SETUP_INSTR_VALUATION_DTLS**), and the fair value of the mitigants are captured in the FSI setup table for Mitigant Fair Value (**FSI_SETUP_MTGNT_VALUATION_DTLS**).

The mitigants which are used to offset the fair value of the repo exposures, are stamped accounting heads, to ensure that they can be tracked.

The exposure amount calculations are different for the bank acting as a principal in the SFT transactions, and an agent in the SFT transactions. The solution supports both treatments.

For bank acting as an agent, the solution handles all the treatment mentioned in the accord. The data expectation for them are as follows:

- Case 1: Bank is an agent, and does not get involved in any other role with the SFT Exposure

  In this case, the data is not expected in the Repo contracts staging table.

- Case 2: Bank is an agent, and provides a guarantee equal to the difference between the SFT Exposure and the collateral amount

  In this case, the data is expected in the Repo contracts staging table, with the bank role as an agent, and the indemnity indicator (**F_INDEMNITY_IND**) as 'Y'.

The application computes only the Add-on amount for this SFT transaction, inline with the guidelines. And this Add-on amount is populated into the Add-on column of the processing table. This Add-on amount is calculated in the data transformation Lev_Ratio_SFT_Addon_amt.

This is handled in the sub-process (LR - Total Leverage Exposure Amount for SFT) of the process (**Total Leverage Exposure Amount Calculation**).

- Case 3: Bank is an agent, and provides a guarantee more than the difference between the SFT Exposure and the collateral amount

In this case, the data is expected in the Repo contracts staging table, with the bank role as an agent, and the indemnity indicator (F_INDEMNITY_IND) as Y. And a separate guarantee transaction is expected to be recorded in the guarantee staging table. This guarantee transaction is also provided as a mitigant with the mitigant table storing the guarantee contract ID (**V_GUARANTEE_CONTRACT_ID**). The exposure and the mitigant must be mapped to each other in the exposure mitigant mapping table **STG_ACCOUNT_MITIGANT_MAP**).

This guarantee is not for a mitigant treatment, and hence, this is expected with the mitigant eligibility flag as 'N'. This identified guarantee is populated in FNSE.n_repo_contract_skey.

The application computes both the gross exposure amount and the addon amount for this SFT transaction in line with the guidelines. This Add-on amount is calculated in the data transformation Lev_Ratio_SFT_Addon_amt.

This is handled in the sub-process (LR - Total Leverage Exposure Amount for SFT) of the process (**Total Leverage Exposure Amount Calculation**).

7.10.2.5 Total Capital Calculations

The capital measure is calculated in Capital Structure Processing. Capital Measure used in the leverage ratio is equal to Net Tier 1 which is post all regulatory adjustments. The capital structure is the same as the capital calculation run.

7.10.2.6 Leverage Ratio Calculations

The leverage ratio is calculated as follows.

Leverage Ratio = Tier 1 Capital / Total Leverage Exposure Measure

This is computed in the process – Total Leverage Ratio Calculation.

8   BIS Basel III Standardized Approach

Capital Adequacy guidelines as issued in the following regulations are incorporated in OFS Financial Services Basel Regulatory Capital:

BIS Jurisdiction: International Convergence of Capital Measurement and Capital Standards, June 2006.

Basel III: A global regulatory framework for more resilient banks and banking systems, Dec 2010 (rev June 2011).

This approach covers the following topics:

- Credit RWA
- Counterparty Credit RWA
- Default Fund Contributions Related Capital Charge
- Credit Valuation Adjustments
- Credit RWA for Securitization
- Market Risk RWA
- Operational Risk RWA
- Capital Structure
- Capital Buffers
- Large Exposures
- Leverage Ratio

8.1   Credit RWA

Credit RWA is the calculation of Non-securitization RWA

This includes the portfolio of banking and investment for the non-securitized exposures and securitization portfolio for the securitization positions. The application complies with the standardized approach and IRB approach of the credit risk calculations.

A few processes such as Credit Rating, Party Type Reclassification, and Mitigant Data Population are common between. Credit RWA and Counterparty Credit RWA.

This also includes the settlement risk calculation about the unsettled transactions depending on the number of days they are unsettled.

8.1.1   Banking Portfolio

8.1.1.1   Rating Population

The data on ratings is captured in the following rating specific tables:

- Account Rating Table (**STG_ACCOUNT_RATING_DETAILS**)
  - Ratings of all Credit Risk Banking Exposures are captured in this table.

- Party Rating Table (**STG_PARTY_RATING_DETAILS**)

  - Credit Rating for all customers and issuers are captured in this table.

- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)

  - Credit Rating for all countries is captured in this table.

8.1.1.2   Processing Steps

Banks obtain credit ratings from different sources and these are provided as an input in the application through the rating tables mentioned in the preceding list.

This is handled in the sub-process **RATING_RECLASSIFICATION_POPULATION** in **BIS Other Reclassifications** process**.**

The application re-classifies the rating information to BIS Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short Term ratings.

This is handled in the sub-process **Credit Rating Reclassification** in **BIS Other Reclassifications** process**.**

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables.

Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

Ensure that all the columns as indicated in the DL Specs are mandatorily populated with data. For example, in the Stage Party Rating Details (**STG_PARTY_RATING_DETAILS)** table: Rating source code (**V_RATING_SRC_CODE**), Party Code (**V_PARTY_CD**), Purpose (**V_PURPOSE**) are required to be populated. The purpose code is to indicate whether the rating is a domestic rating or foreign rating. If any other rating is provided, then the exposure is considered as unrated.

8.1.1.3   Data Population

Credit Risk exposures are updated in the application for all the product types through their respective input tables known as Product Processors. Main categories of Credit Risk Banking exposures, along with their respective table names that are used as an input, are as follows:

Product	Source Product Processor
Assets Sold	STG_ASSETS_SOLD
Bills	STG_BILLS_CONTRACTS
Credit Cards	STG_CARDS
Guarantees	STG_GUARANTEES
Lease Contracts	STG_LEASE_CONTRACTS
Letters of Credit	STG_LC_CONTRACTS
Line of Credit	STG_CREDIT_LINE_DETAILS
Commitment Contracts	STG_COMMITMENT_CONTRACTS
Loans	STG_LOAN_CONTRACTS
Overdraft	STG_OD_ACCOUNTS

There is a data population about the mitigants, which cater to all the types of mitigants like collateral, guarantee, and credit derivatives. There is one data population about the counter-guarantee for the guarantor.

Product	Source Product Processor
Mitigants – Collateral, Guarantee, Credit Derivatives	STG_MITIGANTS
Counter Guarantee	STG_MITIGANT_COUNTER_GUARANTEE

There is a data population about the mapping between the exposures and the mitigants.

Product	Source Table
Mapping for Exposures and Mitigants	STG_ACCOUNT_MITIGANT_MAP

Processing table details

All Credit Risk Banking exposures are loaded into the table, FSI Cap Banking Exposures (**FSI_CAP_BANKING_EXPOSURES)** where further processing happens for this portfolio of exposures till the computation pertaining to Pre-Credit Risk Mitigation process

This is handled in the process **Banking Data Population**.

8.1.1.4   **Shareholding Percent Multiplication**

Shareholding percent multiplication for common entity level data is a part of **BIS Common Data Processing** (PMFCOM020) process. In this the application updates the shareholding percentage against each entity is updated with the value of 1 as the shareholding percent and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PERCENT).

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity with respect to parent entity against exposure amount, undrawn amount and provision amount for that exposure and update the same.

This is handled in the sub-process **BNK_SHAREHOLDING_CALCULATION_STD of the process Banking Data Processing – STD**.

8.1.1.5   Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, the asset class for each exposure is arrived at. Similarly, the application does reclassification for mitigant based on its mitigant types and reclassifies it to standard mitigant types.

Ensure that all products and party type and mitigants which are bank-specific are reclassified, as part of the setup activity. If they are not reclassified, the treatment might not happen as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product types. For Example, Housing Loan is reclassified as Residential Mortgage Exposure.

This is handled in the **Basel Product Type Reclassification** which is part of the **COMMON_RECLASSIFICATION** process.

Party Type Reclassification

Similar to the product type, the customer type (which are stored as counterparty type) are also reclassified as standard counterparty type. The customer information is expected in the Stage Party Master (STG_PARTY_MASTER), and this also includes the Party Type based on the Stage Party Type Master (STG_PARTY_TYPE_MASTER).

Party type reclassification Rules handle reclassification for customer types. For Example, an Individual is reclassified as Retail.

This is handled in the **Party Type Reclassification w**hich is part of **BIS Other Reclassification** process.

Other Reclassification

As part of the reclassification rules, any other data which is being brought inside the application like seniority, transaction type and so on also get reclassified into OFSAA specific values. This is also mandatory to be done, as otherwise data will not be available for processing as required by the regulator. This happens as part of the process COMMON_RECLASSIFICATION.

8.1.1.6   Asset Reclassification Rules

Based on Basel product type and standard counterparty type, an asset class is formed by the application. This asset class is used for data processing. The asset class is the same as specified in the accord.

For example, Standard counterparty is Corporate non-SME and Corporate SME, the asset class is corporate. For Basel product type Residential Mortgage Exposure, the asset class is Claims Secured by Residential Real Estate.

The asset class for all mitigants is reclassified based on their standard mitigant types and standard issuer type.

This happens in the **BNK_RECLASSIFICATION_STD** sub-process of the process **Banking Data Processing**.

8.1.1.7   Pre-mitigation Calculations

Based on the asset class, the application calculates the Pre-Credit Risk Mitigation (CRM) Exposure at Default (EAD) for each exposure. This value signifies the maximum loss that the bank can suffer, in case of default on this exposure, before considering any mitigation effects.

Some exposures can be hedged against credit risk through various mitigants such as guarantees, collaterals, credit derivatives, and so on. These provide mitigation to credit risk and must be considered while computing Credit RWA, as per the Accord. Hence, the application calculates the pre-mitigation exposure amount and post-mitigation exposure amount.

The application also computes pre-mitigation risk-weighted assets (Pre CRM RWA) and post-mitigation risk-weighted assets (Post CRM RWA) by multiplying the respective EAD by risk weight. The risk weight is arrived at, by considering the credit rating of the exposures and mitigants as per the guidelines.

8.1.1.7.1   Exposure at Default Amount Calculation

Pre CRM EAD

Exposure at Default (EAD) is calculated for all the products. This is being computed using the Exposure Amount (EOP Balance of the Exposure), Undrawn Amount of the Exposure (Undrawn Amount) and the Credit Conversion Factor for the Off-Balance sheet Amount (CCF). This is computed for the on-balance sheet products separately, and the off-balance sheet products separately.

This happens in the sub-process BNK_PRE_CRM_EAD_COMPUTATION_STD in Banking Data Processing – STD process.

Credit Conversion Factor (CCF Assignment)

This is an input required for converting the off-balance sheet component of the exposure (undrawn portion associated with an on-balance sheet or off-balance sheet product, or the exposure amount of an off-balance sheet product). This is based on the supervisory provided values and is determined based on the product type and the maturity associated with the exposure.

This populates the Drawn CCF (for the CCF to be assigned to the exposure amount of the off-balance sheet product) and the Undrawn CCF (for the CCF to be assigned to the undrawn portion of the on balance sheet and off balance sheet exposures).

This happens in the process BNK_CCF_ASSIGNMENT_STD in Banking Data Processing – STD process.

Post CRM EAD

Through the CRM process, the bank considers the effect of the mitigation and calculates the post-mitigation exposure at the default amount. This signifies the maximum loss that the bank can suffer in case of default on this exposure, after considering the effects of the mitigation. This will be the EAD of the Exposure Pre-Mitigation less the covered portion of the mitigant

8.1.1.7.2   Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment process. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessment are first moved into the table FSI Multiple Rating Processing (FSI_MULTIPLE_RATING_PROCESSING) wherein the ranking and final selection of which rating to use takes place.

This happens in the sub process of BNK_MULTIPLE_ASSESSMENT_PROCESSING_DATA_POPULATION, wherein the data for the multiple assessment processing gets populated into the FSI table. MULTIPLE_RATING_ASSESSMENT, wherein the identification of the multiple rating for the exposure happens, and the BNK_MULTIPLE_ASSESSMENT_BASED_RISK_WEIGHT_ASSIGNMENT wherein the actual risk weight and final rating assignment happens for the exposures.

All the above fall under in Banking Data Processing – STD process.

8.1.1.7.3   Issue Issuer Assessment

For all the exposures which remain unrated after the multiple assessment processes, the issue issuer process is performed. This happens in the Issue Issuer Assessment sub-process (**BNK_BNK_ISSUE_ISSUER_ASSESSMENT**). In this case, the unrated exposures are assigned a reference rating based on the reference issue available or the rating of the party, whichever is applicable. These unrated exposures are assigned a risk weight based on the reference rating.

For unrated Banking exposures, the application does an issue-issuer assessment to infer a rating of the unrated exposures, based on the rating of a similar instrument (referred to as reference issue hereafter) issued by the same issuer. The reference issue is used only when it is of the same currency as the exposure and the exposure is senior or equivalent to the same. For the unavailable reference issue, the party rating is used. In the case of the party also being unrated, the exposure remains unrated. Also, the application populates whether the exposure is LT rated or ST rated, based on the rating assigned to the exposure.

8.1.1.7.4   Risk Weight Assignment Rules

Banking Exposures Risk Weight

Risk Weight is assigned based on asset class and the credit rating as per Basel guidelines. The risk weight rules operate on the risk weight table (**FSI_RW_MAP_MASTER**). Highly rated exposures are allocated low-risk weight and poorly rated exposures are allocated high-risk weights. If exposure has more than one rating (rated by more than one agency), then the final rating is assigned based on multiple assessments. The application updates the risk weights against the exposures directly, when ratings are not considered.

Options for risk-weighting are selected during Run definition if the Run Management UI is used, to update the required calculations as allowed by the specific jurisdiction. For more details on the options, see the Run Management section.

Figure 51: Risk Weight Assessment Process Flow
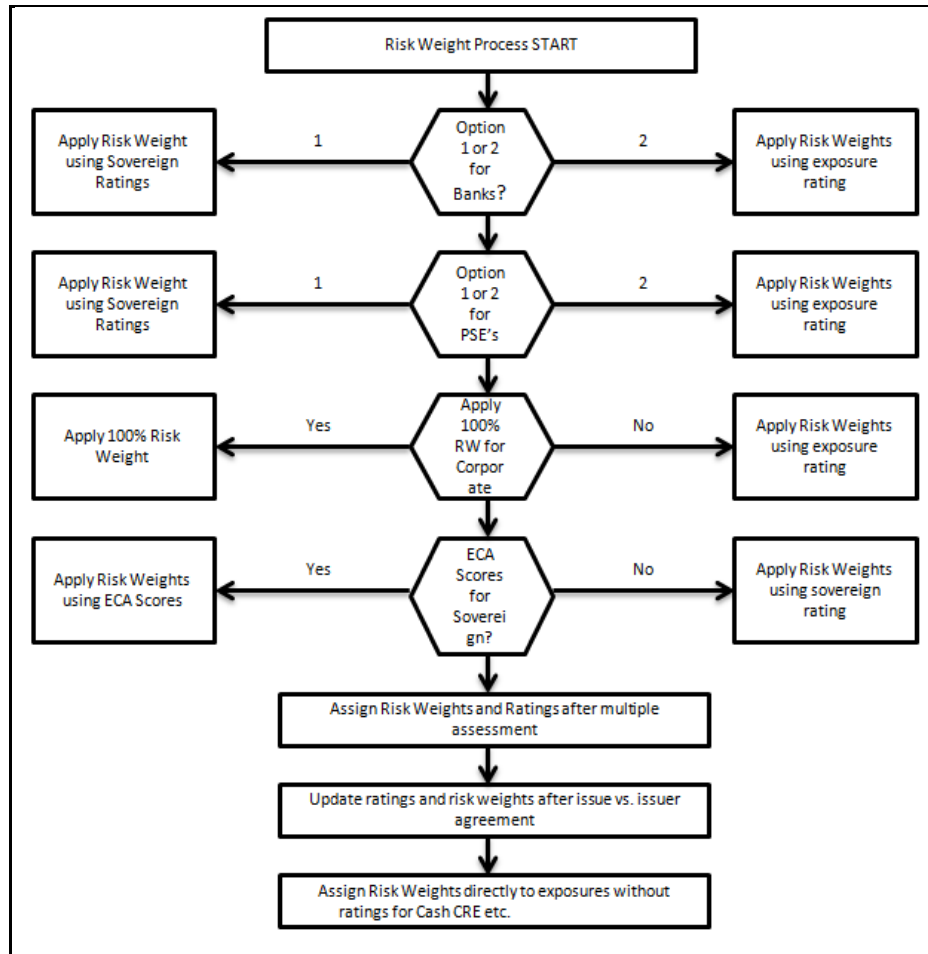
Risk weight assignment takes place in the sub-process: **BNK_RISK_WEIGHT_ASSIGNMENT_STD** in **Banking Data Processing – STD** process.

8.1.1.7.5   RWA Calculations

The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight.

This is handled under the sub-process **BNK_PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_STD** in **Banking Data Processing – STD** process.

8.1.1.8   Credit Risk Mitigation Process

In order to calculate the post CRM RWA, application needs to account for mitigants which may be in the form of collaterals, guarantees, credit derivatives. Not all mitigants are eligible for RWA computation. All the mitigants which get populated into the system are being made ineligible, and then the regulatory approved mitigant types and the issuer type combination are made eligible.

8.1.1.8.1   Mitigant Processing

Mitigant Data population

Mitigant data is loaded from the Stage Mitigant table (STG_MITIGANTS) into the FSI CAP Mitigants table (FSI_CAP_MITIGANTS) where further processing takes place. This is takes place under the sub-process **Mitigant Data Population** under the process **Mitigant Data Processing.**

Mitigant Multiple assessment

Similar to exposures with multiple ratings, mitigants with multiple ratings are also subject to Multiple rating Assessment. This is handled under the sub-process **Mitigant Multiple Rating Assignment – BIS** under the process **Mitigant Data Processing -STD.**

The Data Transformation "CAP_MITIGANT_MULTIPLE_ASSESSMENT_DATA_POP" performs this.

8.1.1.8.2   Mitigant Approaches and their Risk Weighting Rules

Mitigant Risk Weight

For Simple approach, the application assigns risk weight to mitigants on the basis of credit rating (**CAP Mitigant Basel Rating and Risk Weight Assignment**), original maturity (**CAP Mitigant RW Assignment based on Original Maturity**) and for Nettable Liabilities (**CAP Mitigant RW Assignment for Nettable Liabilities**). These fall under the process **Mitigant RW Assignment – Simple –BIS**.

Similarly, for Comprehensive approach, mitigant risk weights are assigned on the basis of credit rating (**CAP Mitigant Basel Rating and Risk Weight Assignment**), for financial collaterals (**CAP Mitigant RW Assignment for Financial Collaterals - Comprehensive Approach**) and for nettable liabilities (**CAP Mitigant RW Assignment for Nettable Liabilities**). These fall under the process **Mitigant RW Assignment – BIS –Comprehensive Appr**.

Mitigant Eligibility

The application identifies the eligible mitigants based on the criteria as mentioned by the Regulator. The application identifies the following standard mitigants– collateral, guarantees, and credit derivatives.

The application is capable of using the Simple Approach and the Comprehensive Approach for the mitigants which are part of the collateral. The application identifies the eligibility of the financial collateral separately for the simple approach and the comprehensive approach. The eligibility of the collateral mitigants are based on the party type of the mitigant, mitigant types, the credit rating assigned to the mitigant or the party (as applicable), and the classification of collateral as senior or not.

For equity, the eligibility is based on the main index equity and the equity trading status. This is handled in CAP Mitigant Eligibility for Equity - Simple approach under the process **Mitigant Collateral Eligibility Simple Approach -BIS**.

For mutual funds, the eligibility is based on the eligible mutual fund indicator. This is handled in **CAP Mitigant Eligibility for Mutual Fund - Simple approach** under the process **Mitigant Collateral Eligibility Simple Approach -BIS**

The application also identifies whether the mitigant is a Re-securitized exposure and if yes, makes it ineligible.

This is handled in **CAP Collateral Eligibility - Simple Approach** under the process **Mitigant Collateral Eligibility Simple Approach -BIS**

 The application identifies the eligibility of the guarantees and credit derivatives based on the party type of the mitigant and the credit rating assigned to the issuer of the mitigant. This is handled in **CAP Non Sec Mitigant Eligibility** under the process **Mitigant Collateral Eligibility Simple Approach –BIS.**

Similar mitigant eligibility rules for Comprehensive Rule can be found in the process **Mitigant Collateral Eligibility – Comprehensive Approach –BIS**

The option for the bank to select Collateral Simple Approach or Comprehensive Approach is based on the Run Management option as selected in the UI.

8.1.1.8.3 Mitigant Haircut Assignment

Under Standardized approach, the bank has to follow supervisory estimates for Mitigant Haircut assignment. This is based on the various categories like mitigant type, residual maturity, rating, issuer type and so on. This is applicable only if the bank follows comprehensive approach for collateral.

Only eligible mitigants are considered for haircut assignment and for further processing. Post haircut assignment, the eligible mitigants are moved from mitigants table (FSI_CAP_MITIGANTS) to sub exposures table (FSI_CAP_SUB_EXPOSURES).

The application does computations for three kinds of mitigant haircuts which are volatility haircut, FOREX haircut, and maturity mismatch haircut.

Volatility Haircut

Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. The application assign haircuts for various type of financial collateral like debt securities, equity, mutual funds, and so on. In the supervisory haircut method, the application assigns volatility haircut based on issues, issuer's ratings, mitigant's residual maturity, and type of mitigant.

This is handled in **CAP CRM Mitigant Volatility Haircut - Supervisory Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

Forex Haircut

If the exposure and collateral are in different currencies, then the application makes an adjustment by applying the FOREX haircut.

This is handled in **CAP CRM Forex Haircut Sub Exposures** under **CRM Sub Exposure Data Haircut Assignment** process.

Maturity Mismatch Haircut

If the residual maturity of the Credit Risk Mitigant is less than that of the underlying credit exposure, then a maturity mismatch haircut is applied to adjust the value.

This is handled under **CAP CRM Maturity Mismatch Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

8.1.2 Investment Portfolio

8.1.2.1 Rating Population

The data on ratings is captured in the following rating specific tables:

- Instrument Rating Table (**STG_INSTRUMENT_RATING_DETAILS**)
  - Ratings for investment exposures subject to credit risk (one that is in **STG_INVESTMENTS**) and mitigants are captured in this table.
- Party Rating Table (**STG_PARTY_RATING_DETAILS**)

- Ratings for the customer are captured in this table.

- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)

  - Credit Rating for all countries is captured in this table.

- External Underlying Exposures Rating Table (**STG_EXT_ULY_ACCT_RATING_DTL**)

  - Credit Rating for all external underlying exposures is captured in this table. In the case of underlying exposures of CIU transactions, it is expected that the value of Exposure ID is that of the instrument ID to which the underlying exposures belong to. For example: If the Underlying Exposure ID EXP001, which belongs to the instrument INSTR001, and which has the parent ID as PARENT001; in this case, the data expected in this table is of the instrument INSTR001, with the Exposure ID as INSTR001.

8.1.2.2   Processing Steps

Banks obtain credit ratings from different sources and these are provided as an input in the application through the rating tables mentioned in the preceding list.

This is handled in the sub-process **RATING_RECLASSIFICATION_POPULATION** in **BIS Other Reclassifications** process.

The application re-classifies the rating information to BIS Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short Term ratings.

This is handled in the sub-process **Credit Rating Reclassification** in **BIS Other Reclassifications** process**.**

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables. Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

Ensure that the following columns are mandatorily populated with data in the **STG_PARTY_RATING_DETAILS** table: Rating source code (**V_RATING_SRC_CODE**), Party Code (**V_PARTY_CD**), Purpose (**V_PURPOSE**): In this field whether the rating is a domestic rating or foreign rating must be indicated. If any other rating is provided, then the exposure is considered as unrated. Data Population.

The following are the preprocessing steps:

Credit Risk exposures are updated in the application for all the product types through their respective input tables known as Product Processors. Main categories of Credit Risk Investment exposures, along with their respective table names that are used as an input, are as follows:

Product	Source Product Processor
Investment Products:	STG_INVESTMENTS
Money Market Instruments	STG_MM_CONTRACTS
Spot Forex Transactions	STG_FX_CONTRACTS
Fixed Assets	STG_FIXED_ASSETS

8.1.2.3   Data Population

There is a data population about the mitigants, which cater to all the types of mitigants like collateral, guarantee, and credit derivatives. There is one data population about the counter-guarantee for the guarantor.

Product	Source Product Processor
Mitigants – Collateral, Guarantee, Credit Derivatives	STG_MITIGANTS
Counter Guarantee	STG_MITIGANT_COUNTER_GUARANTEE

There is a data population about the mapping between the exposures and the mitigants.

Product	Source Table
Mapping for Exposures and Mitigants	STG_ACCOUNT_MITIGANT_MAP

In the case of investments in funds (CIUs), the underlying of the CIU is captured in either of the below tables, depending on the data availability

Product Type	Source Product Processor
Underlying composition Details of CIU	**STG_FUND_CIS_COMPOSITION**
Underlying Exposures of CIU	**STG_FUND_UNDERLYNG_COMPOSITION**

Processing table details

All Credit Risk Investment exposures are loaded into the table, FSI CAP Investment Exposures, **FSI_CAP_INVESTMENT_EXPOSURES** where further processing happens for this portfolio of exposures till the computation pertaining to Pre Credit Risk Mitigation process

This is handled in the process **Investment Data Population**.

8.1.2.4   Shareholding Percent Multiplication

Shareholding percent multiplication for common entity level data is a part of **BIS Common Data Processing** (PMFCOM020) process. In this the application updates the shareholding percentage against each entity. The parent entity is updated with the value of 1 as the shareholding percent and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PERCENT).

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity with respect to parent entity against exposure amount, undrawn amount and provision amount for that exposure and update the same.

This is handled in the sub-process **INV_SHAREHOLDING_CALCULATION_STD** of the process Investment **Data Processing – STD**.

8.1.2.5   Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, the asset class for each exposure is arrived at. Similarly, the application does reclassification for mitigant based on its mitigant types and reclassifies it to standard mitigant types.

Ensure that all products and party type and mitigants which are bank-specific are reclassified, as part of the setup activity. If they are not reclassified, the treatment might not happen as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product types. For Example, Fixed Rate Bond is reclassified as Debt Securities

This is handled in the Basel Product Type Reclassification which is part of the COMMON_RECLASSIFICATION process.

Party Type Reclassification

Similar to the product type, the customer type (which are stored as counterparty type) are also reclassified as standard counterparty type. The customer information is expected in the Stage Party Master (STG_PARTY_MASTER), and this also includes the Party Type based on the Stage Party Type Master (STG_PARTY_TYPE_MASTER).

Party type reclassification Rules handle reclassification for customer types. For Example, housing finance company is reclassified as Corporate

This is handled in the Party Type Reclassification which is part of BIS Other Reclassification process.

Other Reclassification

As part of the reclassification rules, any other data which is being brought inside the application like seniority, transaction type and so on also get reclassified into OFSAA specific values. This is also mandatory to be done, as otherwise data will not be available for processing as required by the regulator.

This happens as part of the process **COMMON_RECLASSIFICATION**.

8.1.2.6   Asset Reclassification Rules

Based on Basel product type and standard counterparty type, an asset class is formed by the application. This asset class is used for data processing. The asset class is the same as specified in the accord.

For example, Standard counterparty is Corporate non-SME and Corporate SME, the asset class is corporate. For Basel product type gold, the asset class is Gold.

The asset class for all mitigants is reclassified based on their standard mitigant types and standard issuer type.

This happens in the sub-process **INV_RECLASSIFICATION_STD** of the process **Investment Data Processing - STD**.

8.1.2.7   Pre-mitigation Calculations

Based on the asset class, the application calculates the Pre-Credit Risk Mitigation (CRM) Exposure at Default (EAD) for each exposure. This value signifies the maximum loss that the bank can suffer, in case of default on this exposure, before considering any mitigation effects.

Some exposures can be hedged against credit risk through various mitigants such as guarantees, collaterals, credit derivatives, and so on. These provide mitigation to credit risk and must be considered while computing Credit RWA, as per the Accord. Hence, the application calculates the pre-mitigation exposure amount and post-mitigation exposure amount.

The application also computes pre-mitigation risk-weighted assets (Pre CRM RWA) and post-mitigation risk-weighted assets (Post CRM RWA) by multiplying the respective EAD by risk weight. The risk weight is arrived at, by considering the credit rating of the exposures and mitigants as per the guidelines.

8.1.2.7.1   Exposure at Default Amount Calculation

Pre CRM EAD

Exposure at Default (EAD) is calculated for all the products. This is being computed using the Exposure Amount (EOP Balance of the Exposure)

This happens in the process **INV_PRE_CRM_EAD_COMPUTATION_STD** of the process **Investment Data Processing - STD**.

Post CRM EAD

Through the CRM process, the bank considers the effect of the mitigation and calculates the post-mitigation exposure at the default amount. This signifies the maximum loss that the bank can suffer in case of default on this exposure, after considering the effects of the mitigation. This will be the EAD of the Exposure Pre-Mitigation less the covered portion of the mitigant

8.1.2.7.2   Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment process. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessment are first moved into the table FSI Mutliple Rating Processing (FSI_MULTIPLE_RATING_PROCESSING) wherein the ranking and final selection of which rating to use takes place.

This happens in the sub process of **INV_MULTIPLE_RATING_ASSESSMENT_DATA_POPULATION,** wherein the data for the multiple assessment processing gets populated into the FSI table. **MULTIPLE_RATING_ASSESSMENT,** wherein the identification of the multiple rating for the exposure happens, and the

INV_MULTIPLE_ASSESSMENT_BASED_RISK_WEIGHT_ASSIGNMENT wherein the actual risk weight and final rating assignment happens for the exposures.

All the above fall under **Investment Data Processing – STD**.

8.1.2.7.3   Issue Issuer Assessment

For all exposures which remain unrated after the multiple assessment processes, the issue issuer process is performed. This happens in the Issue Issuer Assessment sub-process (**INV_INV_ISSUE_ISSUER_ASSESSMENT**). In this case, the unrated exposures are assigned a reference rating based on the reference issue available or the rating of the party, whichever is applicable. These unrated exposures are assigned a risk weight based on the reference rating.

For unrated Non-Securitized exposures, the application does an issue-issuer assessment to infer a rating of the unrated exposures, based on the rating of a similar instrument (referred to as reference issue hereafter) issued by the same issuer. The reference issue is used only when it is of the same currency as the exposure and the exposure is senior or equivalent to the same. For the unavailable reference issue, the party rating is used. In the case of the party also being unrated, the exposure remains unrated. Also, the application populates whether the exposure is LT rated or ST rated, based on the rating assigned to the exposure.

8.1.2.7.4   Risk Weight Assignment Rules

Non-Sec Exposures Risk Weight

Risk Weight is assigned based on asset class and the credit rating as per Basel guidelines. The risk weight rules operate on the risk weight table (**FSI_RW_MAP_MASTER**). Highly rated exposures are allocated low-risk weight and poorly rated exposures are allocated high-risk weights.

If exposure has more than one rating (rated by more than one agency), then the final rating is assigned based on multiple assessments. The application updates the risk weights against the exposures directly, when ratings are not considered.

Options for risk-weighting are selected during Run definition if the Run Management UI is used, to update the required calculations as allowed by the specific jurisdiction. For more details on the options, see the Run Management section.

This is handled under the sub-process: **INV_RISK_WEIGHT_ASSIGNMENT_STD** in **Investment Data Processing – STD** process**.**

Funds/ Collective Investment Units

Equity Investments in Funds – (Collective Investment Units (CIU) Processing)

The CIU is funds that have invested in various exposures. The accord has specified various criteria for risk-weighting CIU exposures. The application supports all the approaches. In the case of CIU, the application follows a hierarchy of approaches:

- Look Through Approach
- Mandate Based Approach
- Fall Back Approach

The exposures to CIU are expected in the table Stage Investments (STG_INVESTMENTS), and the instrument code is expected to be populated for these exposures. The static information related to the instruments is expected in the Instrument contract dimension table (DIM_INSTRUMENT_CONTRACT), and the information about the instruments, which change periodically like the current outstanding issue amount, is expected in the Stage Instrument Contract Detail table (STG_INSTRUMENT_CONTRACT_DTL).

The underlying exposures of CIU are expected in **STG_FUND_CIS_COMPOSITION** with the fund code (instrument code) populated also into Parent Instrument Code.

The underlying composition of the CIU is expected in the table Stage Fund Underlying Composition (**STG_FUND_UNDERLYNG_COMPOSITION)**. This has the underlying composition details of the fund, across various products, and the maximum permissible limit of investment in each of the product types, with the fund code as the Instrument ID.

NOTE: The fund underlying composition and/or the underlying exposures are required for processing, only when the underlying of the fund is not available and when there is mandate information available for the fund.

When the derivatives products are underlying for a CIU, then the MTM value of the derivative is expected to be given as Asset MTM Value (N_ASSET_MTM_VALUE) in Stage Fund CIS Composition (STG_FUND_CIS_COMPOSITION). MTM value of the derivative must also be populated to Composition Value (N_COMPOSITION_VALUE).

	NOTE	Unless operational criteria are met, the look-through approach is not applicable.

Look Through Approach

The first approach in the hierarchy that application assigns based on the operational criteria given in the accord is LTA. To validate the operational criteria or conditions given, data is expected as input. Along with the suggested conditions application also checks for the availability of the underlying information. If all

the sufficient information is available, the application assigns the Look Through Approach (LTA) and computation will be followed as given in the accord. If operational criteria are not met, the application checks for the immediate next approach.

The look through approach are handled in the sub-process **CIU - INV – Risk Weight Method Assignment – Look Through Approach** in the process **INV_CIU_RISK_WEIGHT_METHOD_CALCULATION**.

Mandate Based Approach

This approach is applied when the information of the underlying and the third-party risk weights that can be used under the look-through approach are not available. To continue with this approach banks, need to have the mandate information required. Once the application checks for the information and assigns the approach, computations for MBA under the Standardized approach are in line with the Basel Accord.

This is handled in the sub-process **CIU - INV – Risk Weight Method Assignment – Mandate Based Approach** in the process **INV_CIU_RISK_WEIGHT_METHOD_CALCULATION**.

Fall Back Approach

If no approach from the hierarchy is applicable based on the checks performed, the application assigns Fall Back Approach. In this approach, all the exposures will be risk-weighted at 1250%.

This is handled in the sub-process **CIU - INV – Risk Weight Method Assignment – Fall Back Approach** in the process **INV_CIU_RISK_WEIGHT_METHOD_CALCULATION**.

Partial use of an approach

A bank may use a combination of the three approaches when determining the capital requirements for an equity investment in an individual fund, provided that the conditions for all the approaches are met.

This will be applicable only in the case of the treatment of funds in other funds, as within a fund the method cannot be different.

Treatment of funds invested in other funds

If the underlying information is available, then application checks for the approach that is used by the funds. If the approach is not same across then FBA will be assigned i.e. if the approach used for determining the RW of a fund and the same approach is also where it is invested. Further, if same then application carry on with the same approach (Look through or Mandate based approach respectively), if not then we will assign 1250% under Fall Back Approach.

8.1.2.7.5   RWA Calculations

The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight.

This is handled under the sub-process **INV_PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_STD under the process Investment Data Processing – STD**.

8.1.2.8   Credit Risk Mitigation Process

In order to calculate the post CRM RWA, application needs to account for mitigants which may be in the form of collaterals, guarantees, credit derivatives. Not all mitigants are eligible for RWA computation. All the mitigants which get populated into the system are being made ineligible, and then the regulatory approved mitigant types and the issuer type combination are made eligible.

8.1.2.8.1 Mitigant Processing

Mitigant Data population

Mitigant data is loaded from the Stage Mitigant table (STG_MITIGANTS) into the FSI CAP Mitigants table (FSI_CAP_MITIGANTS) where further processing takes place. This is takes place under the sub-process **Mitigant Data Population** in the process **Mitigant Data Processing.**

Mitigant Multiple assessment

Similar to exposures with multiple ratings, mitigants with multiple ratings are also subject to Multiple rating Assessment. This is handled under the sub-process **Mitigant Multiple Rating Assignment – BIS** in the process **Mitigant Data Processing -STD.**

The Data Transformation "CAP_MITIGANT_MULTIPLE_ASSESSMENT_DATA_POP" performs this.

8.1.2.8.2 Mitigant Eligibility Approaches and their Risk Weighting Rules

Mitigant Risk Weight

For Simple approach, the application assigns risk weight to mitigants based on credit rating (**CAP Mitigant Basel Rating and Risk Weight Assignment**), original maturity (**CAP Mitigant RW Assignment based on Original Maturity**) and for Nettable Liabilities (**CAP Mitigant RW Assignment for Nettable Liabilities**). These fall under the process **Mitigant RW Assignment – Simple –BIS**.

Similarly, for Comprehensive approach, mitigant risk weights are assigned based on credit rating (**CAP Mitigant Basel Rating and Risk Weight Assignment**), for financial collaterals (**CAP Mitigant RW Assignment for Financial Collaterals - Comprehensive Approach**) and for nettable liabilities (**CAP Mitigant RW Assignment for Nettable Liabilities**). These fall under the process **Mitigant RW Assignment – BIS –Comprehensive Appr.**

Mitigant Eligibility

The application identifies the eligible mitigants based on the criteria as mentioned by the Regulator. The application identifies the following standard mitigants– collateral, guarantees, and credit derivatives.

The application can use the Simple Approach and the Comprehensive Approach for the mitigants which part of the collateral are. The application identifies the eligibility of the financial collateral separately for the simple approach and the comprehensive approach. The eligibility of the collateral mitigants are based on the party type of the mitigant, mitigant types, the credit rating assigned to the mitigant or the party (as applicable), and the classification of collateral as senior or not.

For equity, the eligibility is based on the main index equity and the equity trading status. This is handled in CAP Mitigant Eligibility for Equity - Simple approach under the process **Mitigant Collateral Eligibility Simple Approach -BIS**.

For mutual funds, the eligibility is based on the eligible mutual fund indicator. This is handled in **CAP Mitigant Eligibility for Mutual Fund - Simple approach** under the process **Mitigant Collateral Eligibility Simple Approach -BIS**

The application also identifies whether the mitigant is a Re-securitized exposure and if yes, makes it ineligible.

This is handled in **CAP Collateral Eligibility - Simple Approach** under the process **Mitigant Collateral Eligibility Simple Approach -BIS**

The application identifies the eligibility of the guarantees and credit derivatives based on the party type of the mitigant and the credit rating assigned to the issuer of the mitigant. This is handled in **CAP Non-Sec Mitigant Eligibility** under the process **Mitigant Collateral Eligibility Simple Approach –BIS.**

Similar mitigant eligibility rules for Comprehensive Rule can be found in the process **Mitigant Collateral Eligibility – Comprehensive Approach –BIS**.

The option for the bank to select Collateral Simple Approach or Comprehensive Approach is based on the Run Management option as selected in the UI.

8.1.2.8.3   Mitigant Haircut Assignment

Under Standardized approach, the bank must follow supervisory estimates for Mitigant Haircut assignment. This is based on the various categories like mitigant type, residual maturity, rating, issuer type and so on. This is applicable only if the bank follows comprehensive approach for collateral.

Only eligible mitigants are considered for haircut assignment and for further processing. Post haircut assignment, the eligible mitigants are moved from mitigants table (FSI_CAP_MITIGANTS) to sub exposures table (FSI_CAP_SUB_EXPOSURES).

The application does computations for three kinds of mitigant haircuts which are volatility haircut, FOREX haircut, and maturity mismatch haircut.

Volatility Haircut

Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. The application assign haircuts for various type of financial collateral like debt securities, equity, mutual funds, and so on. In the supervisory haircut method, the application assigns volatility haircut based on issues, issuer's ratings, mitigant's residual maturity, and type of mitigant.

This is handled in **CAP CRM Mitigant Volatility Haircut - Supervisory Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

Forex Haircut

If the exposure and collateral are in different currencies, then the application makes an adjustment by applying the FOREX haircut.

This is handled in **CAP CRM Forex Haircut Sub Exposures** under **CRM Sub Exposure Data Haircut Assignment** process.

Maturity Mismatch Haircut

If the residual maturity of the Credit Risk Mitigant is less than that of the underlying credit exposure, then a maturity mismatch haircut is applied to adjust the value.

This is handled under **CAP CRM Maturity Mismatch Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

8.2   Counterparty Credit RWA

Counterparty Credit RWA is the calculation of the counterparty credit risk exposures. This includes the derivative portfolio and the Securities and Financing transaction portfolio. This also includes the exposures in both banking book and trading book.

The counterparty credit exposures also undergo additional RWA calculation in the form of Credit Valuation Adjustment (CVA). The mark to market counterparty credit losses or the spread migration risk is

captured with CVA, which was not directly capitalized before. CVA is the difference between the risk-free portfolio value and the true portfolio value that considers the possibility of the counterparty's default. In other words, CVA is the market value of counterparty credit risk.

8.2.1   Derivatives Portfolio
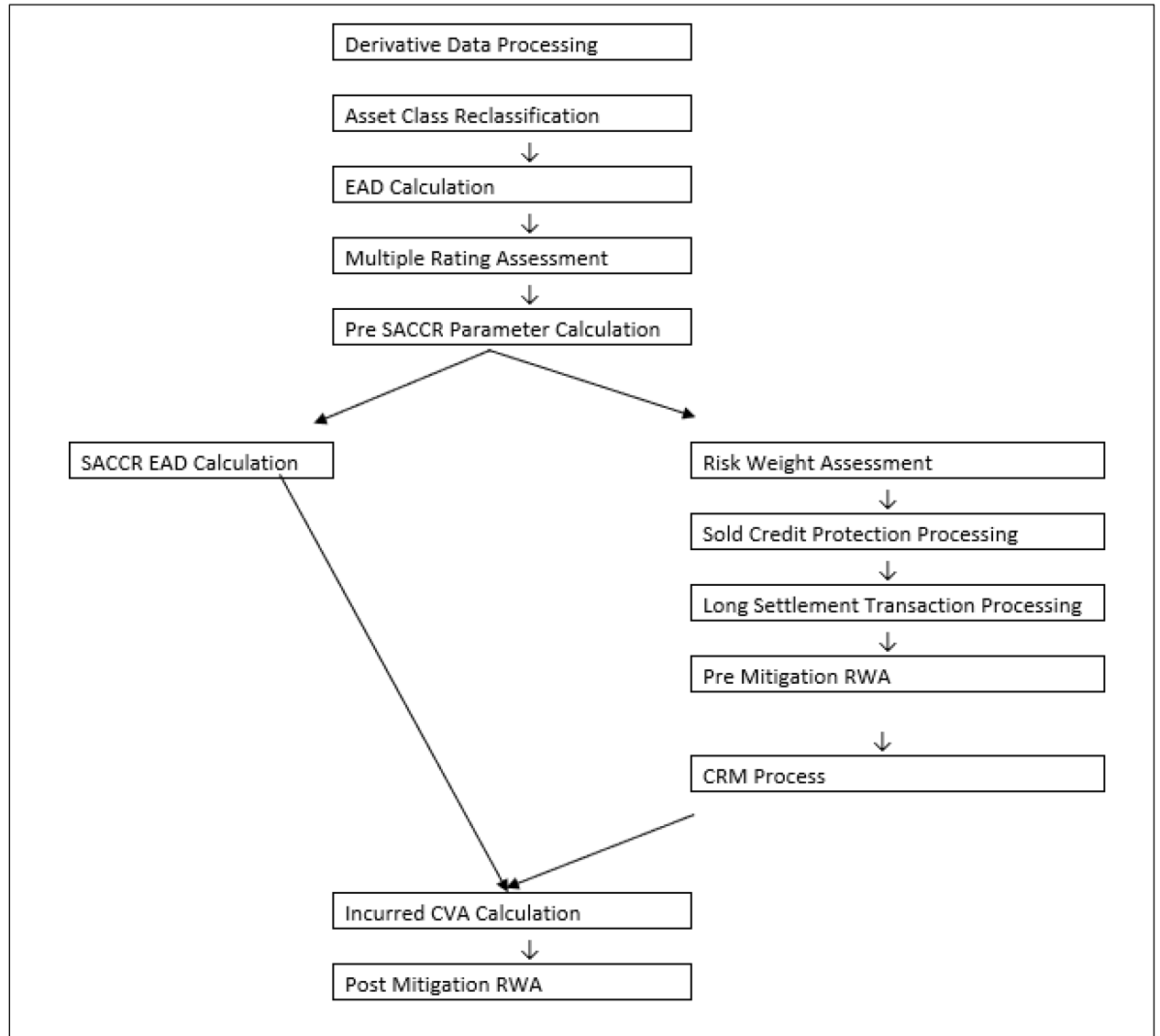
8.2.1.1   Rating Population

The Data on ratings is captured in the following rating specific tables:

- Party Rating Table (**STG_PARTY_RATING_DETAILS**)
  - Credit rating for all are captured in this table.
- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)
  - Credit Rating for all countries is captured in this table.

▪ Instrument Rating Table (**STG_INSTRUMENT_RATING_DETAILS**)

Ratings for all instruments are captured in this table. Even the posted collateral (Placed Collateral) and received collateral (Mitigants) related ratings are captured in this table and this is handled in the process DRV_INSTRUMENT_RATING_POPULATION.

8.2.1.2 Processing Steps

Banks obtain credit ratings from different sources and these are provided as an input in the application through the rating tables mentioned in the preceding list.

This is handled in the process R**ATING_RECLASSIFICATION_POPULATION.**

The application re-classifies the rating information to BIS Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short-Term ratings.

This is handled in the process C**redit Rating Reclassification**.

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables.

Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

Ensure that all the relevant columns as indicated in the DL Specs are mandatorily populated with data. For example, in the Stage Party Rating Details (**STG_PARTY_RATING_DETAILS)** table: Rating source code (**V_RATING_SRC_CODE**), Party Code (**V_PARTY_CD**), Purpose (**V_PURPOSE**) are required to be populated. The purpose code is to indicate whether the rating is a domestic rating or foreign rating. If any other rating is provided, then the exposure is considered as unrated.

8.2.1.3 Data Population

The following are the preprocessing steps:

Credit Risk exposures are updated in the application for all the product types through their respective input tables known as Product Processors. Main categories of Counterparty Credit Risk exposures, along with their respective table names that are used as an input, are as follows:

Product	Source Product Processor
Swaps	STG_SWAPS_CONTRACTS
Futures	STG_FUTURES
Options	STG_OPTION_CONTRACTS
Credit Derivatives	STG_CREDIT_DERIVATIVES
Forwards	STG_FORWARDS

There is a data population about the placed collateral and central counterparty details, which are required for the cleared transaction and default fund contribution treatment.

Product	Source Product Processor

Placed Collateral	STG_PLACED_COLLATERAL
Default Fund Contribution	STG_CCP_DETAILS

There is a data population about the mitigants, which cater to the applicable mitigant type like collateral received for the derivatives

Product	Source Product Processor
Mitigants – Collateral received	STG_MITIGANTS

There is a data population about the mapping between the exposures and the mitigants. And one data population about the mapping between the exposures and the placed collateral

Product	Source Table
Mapping for Exposures and Mitigants	STG_ACCOUNT_MITIGANT_MAP
Mapping for Exposures and Placed Collateral	STG_ACCT_PLACED_COLL_MAP

Processing table details

All Counterparty credit Risk related derivative exposures are loaded into the table, FSI Cap Derivative (**FSI_CAP_DERIVATIVES)** where further processing happens for this portfolio of exposures till they are moved to the Netting set granularity. This is handled in the process Derivative Data Population process, under sub process;

- DERIVATIVE_SWAPS_EXPOSURE_DATA_POPULATION

- DERIVATIVE_FUT_EXPOSURE_DATA_POPULATION

- DERIVATIVE_OPT_EXPOSURE_DATA_POPULATION

- DERIVATIVE_CREDIT_DERIVATIVES_DATA_POPULATION

All placed collateral that the bank has placed, which are not specific to Securities Financing Transactions exposures, are loaded into the table, FSI_ PLACED_COLLATERAL

All the collateral that the bank has received, as part of the Derivative transactions, are loaded into the table, FSI_CAP_MITIGANTS.

8.2.1.4   Shareholding Percent Multiplication

Shareholding percent multiplication for common entity level data is a part of **BIS Common Data Processing** (PMFCOM020) process. In this the application updates the shareholding percentage against each entity. The parent entity is updated with the value of 1 as the shareholding percent and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PERCENT).

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity with respect to parent entity against exposure amount, undrawn amount and provision amount for that exposure and update the same.

This is handled in the sub-process **DRV_SHAREHOLDING_CALCULATION_STD of the process DRV data processing**

8.2.1.5   Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, the asset class for each exposure is arrived at. Similarly, the application does reclassification for mitigant based on its mitigant types and reclassifies it to standard mitigant types.

Ensure that all products and party type and mitigants which are bank-specific are reclassified, as part of the setup activity. If they are not reclassified, the treatment might not happen as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product types. For Example, Interest Rate Futures is reclassified as Futures

This is handled in the Basel Product Type Reclassification which is part of the BIS Other Reclassification process.

Party Type Reclassification

Similar to the product type, the customer type (which are stored as counterparty type) are also reclassified as standard counterparty type. The customer information is expected in the Stage Party Master (STG_PARTY_MASTER), and this also includes the Party Type based on the Stage Party Type Master (STG_PARTY_TYPE_MASTER).

Party type reclassification Rules handle reclassification for customer types. For Example, a Small business entity is reclassified as Corporate SME

This is handled in the Party Type Reclassification which is part COMMON_RECLASSIFICATION process.

Instrument Type Reclassification

Bank Instrument types used by the reporting bank as input data are reclassified to Instrument types. The instrument types after reclassification are stored as Instrument types. For Example, Interest Rate Future Contract is reclassified as Interest Rate Futures. This happens as part of the process COMMON_RECLASSIFICATION process.

Mitigant Reclassification

For mitigants the application reclassifies the mitigant type to the standard mitigant type like the debt securities.

The reclassification tasks are present in the MITIGANT_TYPE_RECLASSIFICATION.

8.2.1.6   Pre-mitigation Calculations - Exposure at Default Amount Calculation

Pre-mitigation Exposure at Default can be calculated using one of the two approaches of EAD – SA CCR and IMM methods. This is based on run management selection.

The Standardized Approach for Counterparty Credit Risk (SA-CCR) is an alternative for Standardized Method (SM) and Current Exposure Method (CEM) for Counterparty Credit Risk (CCR) in Credit Risk.

Banks can use the SA-CCR approach while they follow Standardized or IRB approaches for credit risk. The SA-CCR approach is applicable for Over the Counter (OTC) Derivatives, Exchange Traded Derivatives, and Long Settlement Transactions.

8.2.1.6.1   SA-CCR Method of EAD Computation

The exposures under the SA-CCR consist of two components: replacement cost (RC) and potential future exposure (PFE). The replacement cost is mostly related to the mark to market of the derivative contract, by considering the collateral and margin agreement as relevant. The potential future exposure consists of a multiplier that allows for the partial recognition of excess collateral and an aggregate add-on.

The following flowchart depicts the process flow of SA-CCR.

Figure 52: Process Flow for SA-CCR

Netting Agreement

For instruments participating in netting set, the notability flag should be set as 'Y'. Instruments with the same agreement code are netted in the same netting set.

The application creates new records for netting agreement and then populates into the FSI Netting Agreement Details (FSI_NETTING_AGREEMENT_DETAILS) table. The netting agreements will be populated in the process NETTING_AGREEMENT_DETAILS_DATA_POP.

Margin Agreement

For both RC and PFE, if one of the netting agreements has multiple margin agreements, then this netting agreement should be divided into sub-netting agreements to align with the margin

agreements. This is captured in RC_MARGINED_UNMARGINED_AGREEMENT process Placed Collateral & Mitigant – Eligibility Condition

The mitigant is identified as eligible are not based on the eligibility rules for CRM as mentioned in Basel III accord. Credit rating of the collateral is considered for all mitigants types issued by all party types, while deciding whether a mitigant is eligible for a particular exposure or not. Separate eligibility Rules exist for mitigants types like equity, mutual funds, or debt security, to perform these checks. For the remaining, a mitigant is marked as eligible only if its credit rating is better than the exposure to which it is providing protection and also if it is classified as senior in position. This is handled in the sub process - Mitigant Processing – STD Approach (FSI_CAP_MITIGANTS). Mitigant eligibility is also checked based on the original and residual maturity of the collateral. Collateral is classified as eligible only if its original maturity is more than a year and residual maturity is more than 3 months.

The placed collateral is captured in FSI Cap Placed Collateral (FSI_CAP_PLACED_COLLATERAL) and this also moves to FSI Cap Mitigants (FSI_CAP_MITIGANTS), wherein the placed collateral and the mitigants both undergo the same treatment. This is part of the process FSI_PLACED_COLLATERAL_DATA_POPULATION and FSI_CAP_MITIGANT_DATA_POPULATION.

Placed Collateral & Mitigant – Haircut Assignment

The application assigns three kinds of mitigant haircut, which are volatility haircut, FOREX haircut, and maturity mismatch haircut. Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. Separate Rules exist in the application for various types of financial collaterals like debt securities, equity, mutual funds, and so on. When the exposure and collateral are in different currencies, the application makes an adjustment by applying FOREX haircut. If the residual maturity of CRM is less than the underlying credit exposure, then a maturity mismatch is applied. If there is a maturity mismatch and CRM have an original maturity of more than a year, the maturity mismatch haircut is applied to adjust the value. The application assigns a volatility haircut using Supervisory Haircut method when standardized approach is selected.

This is part of the process   FSI_PLACED_COLLATERAL_DATA_POPULATION and FSI_CAP_MITIGANT_DATA_POPULATION

Replacement Cost

The Replacement Cost (RC) is computed differently for margined and unmargined netting agreements.

All the required attributes for replacement cost are populated from the FSI Cap Derivative Exposures (FSI_CAP_DERIVATIVES) Cap Mitigants (FSI_CAP_MITIGANTS) and FSI Placed Collateral (FSI_PLACED_COLLATERAL) to the table FSI_CAP_NETTABLE_POOL wherein the replacement cost (N_REPLACEMENT_COST) calculation happens. Since there are different calculations required for the replacement cost, depending on whether it is a margined transaction or not, and depending on whether the netting set contains only a single margin agreement or multiple margin agreements, it happens in the table FSI_MARGINED_EAD_CALC. This is handled in the RC_MARGINED_UNMARGINED_TRANSACTION process.

In the case of contracts covered by margin agreement, the Initial margin and the Variation margin are expected at the netting agreement level. The minimum transfer amount and threshold amount are also expected at the netting agreement level and expected to be provided as an input in the Stage Net Exposures tables (STG_NET_EXPOSURES).

Methods of identifying various risk categories and risk drivers

For each exposure, the banks must identify the primary risk driver of the risk factors such as interest rate, foreign exchange, credit, equity, or commodity. This is crucial because the Add-on formula for each risk category is different and it depends on the nature of the risk factors. The risk categories can be identified by defining the primary risk factors of underlying exposures in the derivative contracts.

This is selected by the bank based on the Run Management UI.

- Sensitivities Based Method

- SA-CCR Based Method

    o All the Add-ons are computed for the instrument, with respect to all material risk drivers as per the SA CCR calculation. Using this, the material risk categories are identified, as the one with the maximum absolute value of sensitivity multiplied by the risk weight. This gets handled in the process and the table.

- Fall Back Approach

    o All the Add-ons are computed for the instrument, with respect to all risk drivers. And all the risk categories will be considered as the material risk driver. This gets handled in the process and the table.

Essentially, it will be one instrument that can be mapped to multiple risk categories, with one material risk driver identified for each risk category. And the resultant replacement cost will be summation of the add-on across all the material risk categories.

The data for Risk Drivers and Categories will be from tables,

- FSI Cap Risk Category Master (FSI_CAP_RISK_CATEGORY_MASTER)

- FSI Cap Risk Driver Master (FSI_CAP_RISK_DRIVER_MASTER)

- FSI Cap Risk Driver Map Master (FSI_CAP_RISK_DRIVER_MAP_MASTER)

- Parameter Calculations for Potential Future Exposure

The parameters to be considered for the Calculation of Potential Future Exposure, which is treated under the process PRE_POTENTIAL_FUTURE_RISK_PARAMETERS,

Multiplier

The multiplier in the PFE formula serves to reduce the add-on for over collateralization as in practice many banks hold excess collateral precisely to offset potential increases in exposure represented by the add-on.

Aggregate Add-on

The asset classes; interest rate, foreign exchange, credit, equity or commodity and a derivatives transaction is assigned to an asset class based on its primary risk driver. The add-ons for each asset class are simply aggregated.

Most derivative transactions have one primary risk driver, defined by its reference to underlying instrument.

Adjusted Notional

For interest rate and credit derivatives, the trade-level adjusted notional is the product of the trade notional amount, converted to the domestic currency, and the supervisory duration (SD).

Supervisory delta adjustments

These parameters are also defined at the trade level and are applied to the adjusted notional amounts to reflect the direction of the transaction. For derivatives that are not options, the value of this parameter is +1 for long (MTM increases when the value of the primary risk factor increases) or -1 for short (MTM decreases when the value of the primary risk factor increases).

Supervisory correlation parameters

These parameters only apply to the PFE add-on calculation for equity, credit and commodity derivatives. For these asset classes, the supervisory correlation parameters are derived from a single-factor model and specify the weight between systematic and idiosyncratic components.

Potential Future Exposure (PFE)

The Potential Future Exposure (PFE) is computed differently for each of the risk categories, and the final value is assigned to the netting set (stored at the FSI Cap Nettable Pool (FSI_CAP_NETTABLE_POOL).

PFE add-ons are calculated for each asset class within a netting set and then aggregated. Add-ons for an asset class require the use of hedging sets, which are transactions within a single netting set within which partial or full offsetting is recognized in the methodology.

For Interest rate derivatives a hedging set consists of all derivatives Hedging sets are further divided into maturity categories. Long and short positions in the same hedging set are permitted to fully offset each other within maturity categories; across maturity categories, partial offset is recognized.

For the calculation of PFE, it is required to adopt the unmargined methodology. This is because, one margin agreement applies to multiple netting agreements and collaterals are based on the netted MTM values of the derivative contracts.

This is handled in FSI_POTENTIAL_FUTURE_EXP_CALC.

Exposure at Default Calculations (EAD)

Through the CRM process, the bank takes into account the mitigation effect and calculates the post mitigation exposure at default amount. This signifies the maximum loss that the bank can suffer in case of default on this exposure, after considering all the mitigation effects. The application also computes pre-mitigation risk weighted assets in the process DRV_PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION and post mitigation risk weighted assets in the process DRV_POST_CRM_RISK_WEIGHTED_ASSET_CALCULATION by multiplying the respective EAD by risk weight. The risk weight in this case is arrived at by analyzing the credit rating of the exposures or mitigants.

The risk weight is arrived at by multiplying pre-mitigation capital charge with 12.5. Through the Credit Risk Mitigation, the bank considers the effects of mitigation. The application checks mitigant eligibility based on the Basel specifications and assigns a haircut to each mitigant based on their currency, residual maturity, and expected volatility in their market value.

8.2.1.7 Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment process. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessment are first moved into the table FSI Multiple Rating Processing (**FSI_MULTIPLE_RATING_PROCESSING**) wherein the ranking and final selection of which rating to use takes place.

This happens in the sub process of **DRV_MULTIPLE_ASSESSMENT_PROCESSING_DATA_POP,** wherein the data for the multiple assessment processing gets populated into the FSI table. MULTIPLE_RATING_ASSESSMENT, wherein the identification of the multiple rating for the exposure happens, and the DRV_MULTIPLE_ASSESSMENT_BASED_RISK_WEIGHT wherein the actual risk weight and final rating assignment happens for the exposures.

8.2.1.8 Issue Issuer Assessment

For all the exposures which remain unrated after the multiple assessment processes, the issue issuer process is performed. This happens in the Issue Issuer Assessment sub-process (**DRV_ISSUE_ISSUER_ASSIGNMET**). In this case, the unrated exposures are assigned a reference rating based on the reference issue available or the rating of the party, whichever is applicable. These unrated exposures are assigned a risk weight based on the reference rating.

For Derivatives, the application does an issue-issuer assessment to infer a rating of the unrated exposures, based on the rating of a similar instrument (referred to as reference issue hereafter) issued by the same issuer. The reference issue is used only when it is of the same currency as the exposure and the exposure is senior or equivalent to the same. For the unavailable reference issue, the party rating is used. In the case of the party also being unrated, the exposure remains unrated. Also, the application populates whether the exposure is LT rated or ST rated, based on the rating assigned to the exposure.

8.2.1.9 Risk Weight Assignment Rules

Risk Weight Assignment to all Exposures

Risk Weight is assigned based on asset class and the credit rating as per Basel guidelines. The risk weight rules operate on the risk weight table (**FSI_RW_MAP_MASTER**). Highly rated exposures are allocated low-risk weight and poorly rated exposures are allocated high-risk weights. If exposure has more than one rating (rated by more than one agency), then the final rating is assigned based on multiple assessments. The application updates the risk weights against the exposures directly, when ratings are not considered.

Options for risk-weighting are selected during Run definition if the Run Management UI is used, to update the required calculations as allowed by the specific jurisdiction. For more details on the options, please refer the Run Management section.

Figure 53: Process Flow for Risk Weight Assignment Rules

Risk weight assignment takes place in the sub-process: **DRV_RISK_WEIGHT_ASSIGNMENT_STD**.

Risk Weight Assignment to Sold Credit Protection Exposures

The sold credit protection data is specific to sold credit derivatives. This data is available in the product processor table STG_CREDIT_DERIVATIVES. The sold credit protection data is processed under **SOLID_PROTECTION_CREDIT_DATA_PROCESSING.** The underlying data are required for all the sold credit protection.

The risk weight assignment for the sold credit protection is based on the asset type of the underlying exposure captured in **Non-Sec Pre-Mitigation RW Assignment for Rated SCP - STD**

- The risk weight for the underlying exposure is calculated and this is updated to the sold credit protection exposure under the sub process **Derivative Pre-Mitigation RW UL for SCP based on Revised Sec Framework**

- The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight

- In the case of sold credit protection exposures, the Pre-Mitigation EAD and the Post Mitigation EAD are the same since there are no mitigants for these exposures.

The underlying data for sold credit protection data is provided in the STG_UNDERLYING_EXPOSURES table. The underlying for the sold credit protection have V_UNDERLYING_DATA_IDENTIFIER where the underlying of the sold credit protection have the

"V_UNDERLYING_DATA_IDENTIFIER" as "SCP", to recognize this for the Sold credit protection treatment captured in sub process Derivative_SCP_underlying.

Risk Weight Assignment to Cleared Transaction Exposures

Where a bank acts as a clearing member of a CCP for its own purposes, a risk weight of 2% must be applied to the bank's trade exposure to the CCP in respect of OTC derivatives, exchange traded derivative transactions and SFTs. Where the clearing member offers clearing services to clients, the 2% risk weight also applies to the clearing member's trade exposure to the CCP that arises when the clearing member is obligated to reimburse the client for any losses suffered due to changes in the value of its transactions in the event that the CCP defaults. This captured in process DRV_RISK_WEIGHT_ASSIGNMENT in sub process Derivative Basel III - RW Assignment for Cleared Transactions - Exposures - Revised Approach.

Risk Weight Assignment to Specific Wrong Way Risk Exposures

Specific Wrong Way Risk: Wrong-way risk is defined as the risk that occurs when exposure to counterparty is adversely correlated with the credit quality of that counterparty. It arises when default risk and credit exposure increase together. For all the transactions which are identified as Specific wrong way risk, Risk weight is assigned in process DRV_RISK_WEIGHT_ASSIGNMENT.

8.2.1.10   RWA Calculations

The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight.

In the case of sold credit protection exposures, the Pre-Mitigation EAD and the Post-mitigation EAD is the same since there are no mitigants for these exposures.

8.2.1.11   Post CRM RWA Calculations

In the case of derivatives, there are no additional mitigants, and hence both pre-CRM RWA calculations and post CRM RWA calculations are one and the same.

8.2.1.12   Allocation of RWA at Exposures

CCR RWA calculated at the netting set level is allocated to the exposures of the nettable pool using the following formula:

RWA at Exposure Level = Total CCR RWA at netting set level * Pre-Mitigation EAD for Exposure / Sum of Pre-Mitigation EAD for all Exposures part of CCR RWA at netting set level

8.2.2   Securities Financing Transactions Portfolio

Securities Financing Transactions (SFT) include Repo Style transactions, Margin Lending, Security Financing Borrowing, and so on. Under Standardized method we have two approaches -1. Simple approach – this is the approach wherein the collateral is being substituted for the covered portion of the exposure, and the risk weights as applicable for the standard mitigant type and issuer type are assigned to the collateral. and 2. Comprehensive approach – this is the approach wherein the collateral undergoes haircut treatment and the exposure value gets reduced from this portion

For all SFT contracts which have a placed collateral or mitigant mapped to it, the application computes CRM based on the RWA approach undertaken by the bank.

Process Flow for Credit Risk Securities Financing Transactions

Figure 54: Process Flow for Credit Risk Securities Financing Transactions
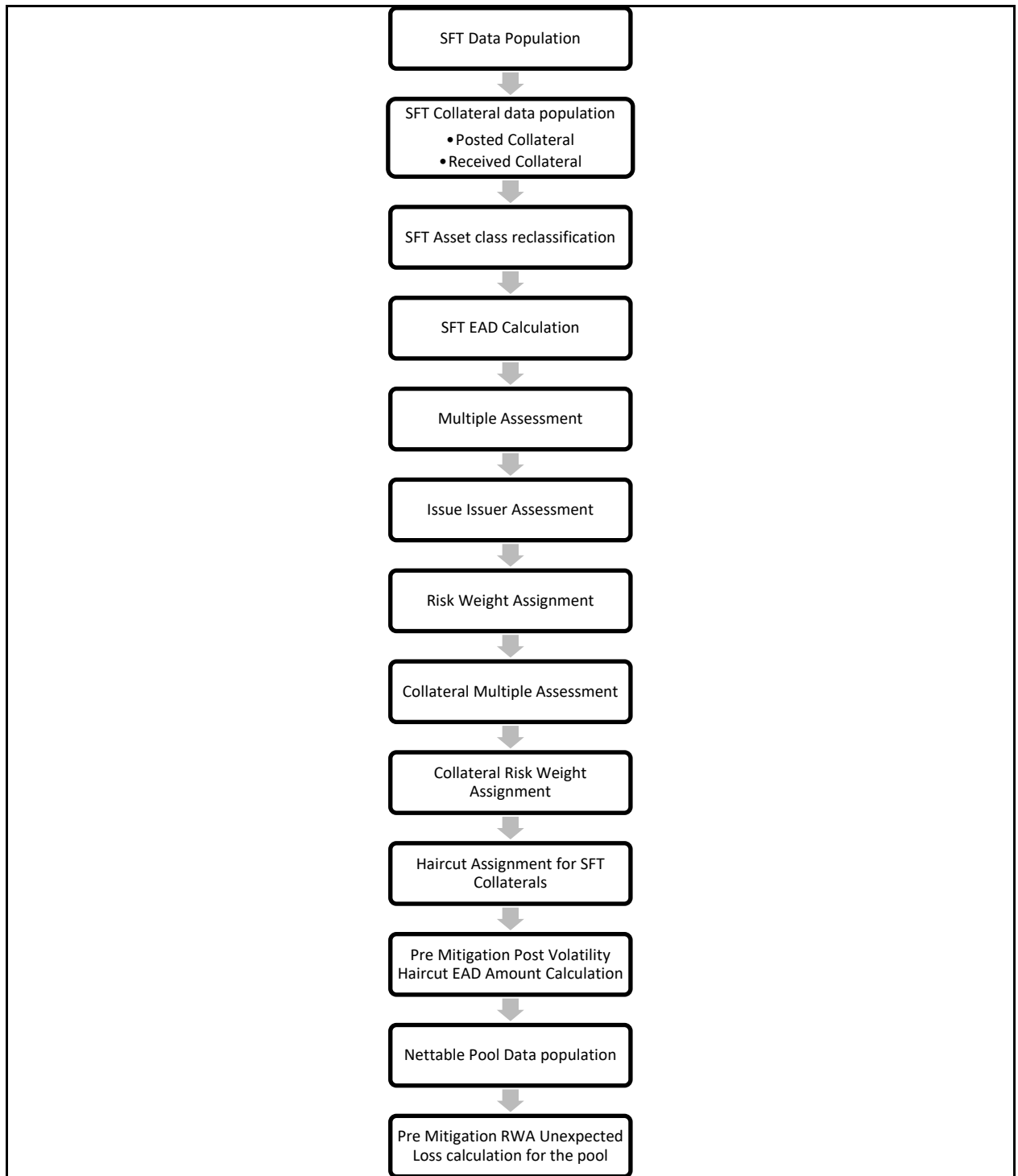
8.2.2.1 Rating Population

The data on ratings is captured in the following rating specific tables:

- Party Rating Table (**STG_PARTY_RATING_DETAILS**)

- Credit Rating for all customers and issuers are captured in this table.

- Instrument Rating Table (STG_INSTRUMENT_RATING_DETAILS)

    - Credit Rating for all instruments which are in the form of collateral either placed or received, are captured in this table

- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)

    - Credit Rating for all countries is captured in this table.

8.2.2.1.1 Processing Steps

Banks obtain credit ratings from different sources and these are provided as an input in the application through the rating tables mentioned in the preceding list.

This is handled in the process **RATING_RECLASSIFICATION_POPULATION.**

The application re-classifies the rating information to BIS Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short-Term ratings.

This is handled in the process **Credit Rating Reclassification**.

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables.

Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

Ensure that all the relevant columns as indicated in the DL Specs are mandatorily populated with data. For example, in the Stage Party Rating Details (**STG_PARTY_RATING_DETAILS)** table: Rating source code (**V_RATING_SRC_CODE**), Party Code (**V_PARTY_CD**), Purpose (**V_PURPOSE**) are required to be populated. The purpose code is to indicate whether the rating is a domestic rating or foreign rating. If any other rating is provided, then the exposure is considered as unrated.

8.2.2.2 Data Population

Credit Risk exposures are updated in the application for all the product types through their respective input tables known as Product Processors. Main categories of Counterparty Credit Risk exposures, along with their respective table names that are used as an input, are as follows:

Product	Source Product Processor
Margin Lending Transactions	STG_LOAN_CONTRACTS
Re purchase contracts	STG_REPO_CONTRACTS

There is a data population about the placed collateral that have been placed with respect to the SFT transaction.

Product	Source Product Processor
Placed Collateral	STG_PLACED_COLLATERAL

There is a data population about the mitigants, which cater to the mitigants that have been received with respect to the SFT transaction.

Product	Source Product Processor
Mitigants – Collateral Received	STG_MITIGANTS

There is a data population about the mapping between the exposures and the mitigants. And one data population about the mapping between the exposures and the placed collateral.

Product	Source Table
Mapping for Exposures and Mitigants	STG_ACCOUNT_MITIGANT_MAP
Mapping for Exposures and Placed Collateral	STG_ACCT_PLACED_COLL_MAP

Processing table details

All Counterparty Credit Risk SFT exposures are loaded into the table, FSI Cap SFT Exposures (**FSI_CAP_SFT_EXPOSURES)** where further processing happens for this portfolio of exposures.

This is handled in the process **SFT_Data_Population**.

8.2.2.3 Shareholding Percent Multiplication

Shareholding percent multiplication for common entity level data is a part of **BIS Common Data Processing** (PMFCOM020) process. In this the application updates the shareholding percentage against each entity. The parent entity is updated with the value of 1 as the shareholding percent and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PCT).

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity with respect to parent entity against exposure amount, undrawn amount and provision amount for that exposure and update the same.

This process is handled in the sub process SFT_SHAREHOLDING_CALCULATION_STD of the process SFT_DATA_PROCESSING_STD.

8.2.2.4 Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, the asset class for each exposure is arrived at. Similarly, the application does reclassification for mitigant based on its mitigant types and reclassifies it to standard mitigant types.

Ensure that all products and party type and mitigants which are bank-specific are reclassified, as part of the setup activity. If they are not reclassified, the treatment might not happen as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product

types. For Example, any security lending product is reclassified as Security lending and borrowing product type.

This is handled in the Basel Product Type Reclassification which is part of the COMMON_RECLASSIFICATION process.

Party Type Reclassification

Similar to the product type, the customer type (which are stored as counterparty type) are also reclassified as standard counterparty type. The customer information is expected in the Stage Party Master (STG_PARTY_MASTER), and this also includes the Party Type based on the Stage Party Type Master (STG_PARTY_TYPE_MASTER).

Party type reclassification Rules handle reclassification for customer types. For Example, any central bank is reclassified as Sovereign.

This is handled in the Party Type Reclassification which is part of BIS Other Reclassification process.

Mitigant Reclassification

For mitigants the application reclassifies the mitigant type to the standard mitigant type like the debt securities, cash, and so on.

The reclassification tasks are present in the MITIGANT_TYPE_RECLASSIFICATION.

Other Reclassification

As part of the reclassification rules, any other data which is being brought inside the application like seniority, transaction type and so on also get reclassified into OFSAA specific values. This is also mandatory to be done, as otherwise data will not be available for processing as required by the regulator.

This happens as part of the process COMMON_RECLASSIFICATION.

8.2.2.5   Asset Reclassification Rules

Based on Basel product type and standard counterparty type, an asset class is formed by the application. This asset class is used for data processing. The asset class is the same as specified in the accord.

For example, Standard counterparty is Corporate non-SME and Corporate SME, the asset class is corporate.

The asset class for all mitigants is reclassified based on their standard mitigant types and standard issuer type.

This happens in the sub process SFT_RECLASSIFICATION_STD and in the process SFT_DATA_PROCESSING_STD.

8.2.2.6   Pre-mitigation Calculations

Based on the asset class, the application calculates the Pre-Credit Risk Mitigation (CRM) Exposure at Default (EAD) for each exposure. This value signifies the maximum loss that the bank can suffer, in case of default on this exposure, before considering any mitigation effects.

In the case of SFT Exposures, the exposures are hedged against credit risk through various collateral. These collaterals provide mitigation to credit risk and must be considered while computing Credit RWA, as per the Accord. Hence, the application calculates the pre-mitigation exposure amount and post-mitigation exposure amount.

The application also computes pre-mitigation risk-weighted assets (Pre CRM RWA) and post-mitigation risk-weighted assets (Post CRM RWA) by multiplying the respective EAD by risk weight. The risk weight is arrived at, by considering the credit rating of the exposures and mitigants as per the guidelines.

8.2.2.6.1   Exposure at Default Amount Calculation

Pre-mitigation Exposure at Default can be calculated using one of the two approaches of EAD – Simple Approach and Comprehensive Approach. This is based on run management selection.

Calculation of EAD – Comprehensive Approach

As per the Comprehensive Approach, the EAD is computed by considering the Exposure amount post haircut, and the collateral amount post haircut.

Exposure Amount Calculations for the Exposures

The exposure amount from the product processor tables STG_REPO_CONTRACTS and STG_LOAN_CONTRACTS for the respective products are based on their EOP balance i.e nothing but the End of period balance, which will be populated in to the processing table (FSI_CAP_SFT_EXPOSURES) for further calculations.

This is part of the process   SFT DATA POPULATION.

Placed Collateral & Mitigant – Eligibility

The mitigant is identified as eligible are not based on the eligibility rules for CRM as mentioned in Basel III accord. Credit rating of the collateral is considered for all mitigants types issued by all party types, while deciding whether a mitigant is eligible for a particular exposure or not. Separate eligibility Rules exist for mitigants types like equity, mutual funds, or debt security, to perform these checks. For the remaining, a mitigant is marked as eligible only if its credit rating is better than the exposure to which it is providing protection and also if it is classified as senior in position.

This is handled in the sub process - Mitigant Processing – STD Approach (FSI_CAP_MITIGANTS). Mitigant eligibility is also checked based on the original and residual maturity of the collateral. Collateral is classified as eligible only if its original maturity is more than a year and residual maturity is more than 3 months.

The placed collateral is captured in FSI Cap Placed Collateral (FSI_CAP_PLACED_COLLATERAL) and this also moves to FSI Cap Mitigants (FSI_CAP_MITIGANTS), wherein the placed collateral and the mitigants both undergo the same treatment.

This is part of the sub process Mitigant Processing – STD Approach – BIS in the process   SFT_PLACED_COLLATERAL_DATA_PROCESSING_STD.

Placed Collateral & Mitigant – Haircut Assignment

The application assigns three kinds of mitigant haircut, which are volatility haircut, FOREX haircut, and maturity mismatch haircut.

Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. Separate Rules exist in the application for various types of financial collaterals like debt securities, equity, mutual funds, and so on. The application assigns a volatility haircut using Supervisory Haircut method when standardized approach is selected.

When the exposure and collateral are in different currencies, the application makes an adjustment by applying FOREX haircut.

If the residual maturity of CRM is less than the underlying credit exposure, then a maturity mismatch is applied. If there is a maturity mismatch and CRM have an original maturity of more than a year, the maturity mismatch haircut is applied to adjust the value.

This is part of the sub process SFT_COMPREHENSIVE_APPROACH_HAIRCUT_in the process   SFT_PLACED_COLLATERAL_DATA_PROCESSING_STDEAD Calculation for Exposures that are not part of netting agreement

For SFT transaction, the application calculates EAD for the parent exposure, based on the underlying information. The underlying exposures (which are the mitigants received and the collateral placed) are moved to **FSI_SFT_UNDERLYING** table from **FSI_CAP_MITIGANTS. FOREX** haircut is applied if the underlying and the parent contract are in a different currency. Each SFT underlying exposure adjusted for a haircut (EAD + haircut value) is added as EAD to the parent contract.

This is part of the process SFT_EXP_AND_PLACED_COLLATERAL_PROCESSING_STD.

EAD Calculation for Exposures that are part of netting agreement

The application nets SFT contracts based on the same customer, common netting agreement identifier, the transaction of Repo, Re-Repo or Margin Lending, Trading or Banking book, and so on. Margin lending transaction being SFT also follows the same EAD calculation methodology, however Repo or Reverse Repo and margin lending are not netted together.

The calculation happens in the table FSI Cap Nettable pool (FSI_CAP_NETTABLE_POOL). This is handled in the process SFT_NETTING_CALCULATION.

Calculation of EAD – Simple Approach

As per the Simple Approach, the EAD is computed by considering the Exposure amount and the mitigants assigned being sent under Credit Risk Mitigation process and assigning based on the Risk Weight of the Mitigants and the Exposures.

Exposure Amount Calculations for the Exposures

The exposure amount from the product processor tables STG_REPO_CONTRACTS and STG_LOAN_CONTRACTS for the respective products are based on their EOP balance i.e nothing but the End of period balance which will be populated in to the processing table (FSI_CAP_SFT_EXPOSURES) for further calculations. **This is part of the process   SFT DATA POPULATION.**

Placed Collateral & Mitigant – Eligibility

The mitigant is identified as eligible are not based on the eligibility rules for CRM as mentioned in Basel III accord. Credit rating of the collateral is considered for all mitigants types issued by all party types, while deciding whether a mitigant is eligible for a particular exposure or not. Separate eligibility Rules exist for mitigants types like equity, mutual funds, or debt security, to perform these checks. For the remaining, a mitigant is marked as eligible only if its credit rating is better than the exposure to which it is providing protection and also if it is classified as senior in position.

This is handled in the sub process - Mitigant Processing – STD Approach (FSI_CAP_MITIGANTS). Mitigant eligibility is also checked based on the original and residual

maturity of the collateral. Collateral is classified as eligible only if its original maturity is more than a year and residual maturity is more than 3 months.

The placed collateral is captured in FSI Cap Placed Collateral (FSI_CAP_PLACED_COLLATERAL) and this also moves to FSI Cap Mitigants (FSI_CAP_MITIGANTS), wherein the placed collateral and the mitigants both undergo the same treatment. This is part of the sub process Mitigant Processing – STD Approach – BIS in the process SFT_PLACED_COLLATERAL_DATA_PROCESSING_STD.

Placed Collateral & Mitigant – Risk Weight Assignment

For Simple approach, the application assigns risk weight to mitigants on the basis of credit rating (CAP Mitigant Basel Rating and Risk Weight Assignment), and original maturity (CAP Mitigant RW Assignment based on Original Maturity). These fall under the process Mitigant RW Assignment – Simple –BIS.

This is part of the sub process Mitigant Processing – STD Approach – BIS in the process   SFT_PLACED_COLLATERAL_DATA_PROCESSING_STD

EAD Calculation for Exposures that are not part of netting agreement

For SFT transaction, the application calculates EAD for the parent exposure, based on the underlying information.

The underlying exposures (which are the mitigants received and the collateral placed) are moved to **FSI_SFT_UNDERLYING** table from **FSI_CAP_MITIGANTS.**

This is part of the process SFT_EXP_AND_PLACED_COLLATERAL_PROCESSING_STD The SFT exposures EAD by considering the collateral placed and received are handled as part of the credit risk mitigation process. This is in the PMF process CRM Data Processing.

EAD Calculation for Exposures that are part of netting agreement

The application nets SFT contracts based on the same customer, common netting agreement identifier, the transaction of Repo, Re-Repo or Margin Lending, Trading or Banking book, and so on. Margin lending transaction being SFT also follows the same EAD calculation methodology, however Repo or Reverse Repo and margin lending are not netted together.

The netted exposure of the SFT gets computed without the effects of the collateral received and placed in the FSI Cap Nettable Pool (FSI_CAP_NETTABLE_POOL). This gets handled in the process SFT_NETTING_CALCULATION.

The SFT exposures EAD by considering the collateral placed and received are handled as part of the credit risk mitigation process. This is in the PMF process CRM Data Processing.

8.2.2.6.2   Risk Weight Assignment

Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment process. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessment are first moved into the table FSI Multiple Rating Processing (FSI_MULTIPLE_RATING_PROCESSING) wherein the ranking and final selection of which rating to use takes place.

Below are the related sub-processes:

SFT_MULTIPLE_ASSESSMENT_PROCESSING_DATA_POP, wherein the data for the multiple assessment processing gets populated into the FSI table.

MULTIPLE_RATING_ASSESSMENT, wherein the identification of the multiple rating for the exposure happens, and the

SFT_MULTIPLE_ASSESSMENT_BASEL_RISK_WEIGHT_ASSIGNMENT, wherein the actual risk weight and final rating assignment happens for the exposures.

Issue Issuer Assessment

For all the exposures which remain unrated after the multiple assessment processes, the issue issuer process is performed. This happens in the Issue Issuer Assessment sub-process

(SFT_ISSUE_ISSUER_ASSESSMENT)

In this case, the unrated exposures are assigned a reference rating based on the reference issue available or the rating of the party, whichever is applicable. These unrated exposures are assigned a risk weight based on the reference rating.

For unrated exposures, the application does an issue-issuer assessment to infer a rating of the unrated exposures, based on the rating of a similar instrument (referred to as reference issue hereafter) issued by the same issuer. The reference issue is used only when it is of the same currency as the exposure and the exposure is senior or equivalent to the same. For the unavailable reference issue, the party rating is used. In the case of the party also being unrated, the exposure remains unrated. Also, the application populates whether the exposure is LT rated or ST rated, based on the rating assigned to the exposure.

Risk Weight Assignment

Risk Weight is assigned based on asset class and the credit rating as per Basel guidelines. The risk weight rules operate on the risk weight table (FSI_RW_MAP_MASTER). Highly rated exposures are allocated low-risk weight and poorly rated exposures are allocated high-risk weights. If exposure has more than one rating (rated by more than one agency), then the final rating is assigned based on multiple assessments. The application updates the risk weights against the exposures directly, when ratings are not considered.

Options for risk-weighting are selected during Run definition if the Run Management UI is used, to update the required calculations as allowed by the specific jurisdiction. For more information on the options, see the [Run Management](#) section.

Risk Weight Assignment happens in the process "SFT_RISK_WEIGHT_ASSIGNMENT STD"" for the SFT Exposures.

Figure 55: Process Flow for Process Flow for Risk Weight Assessment
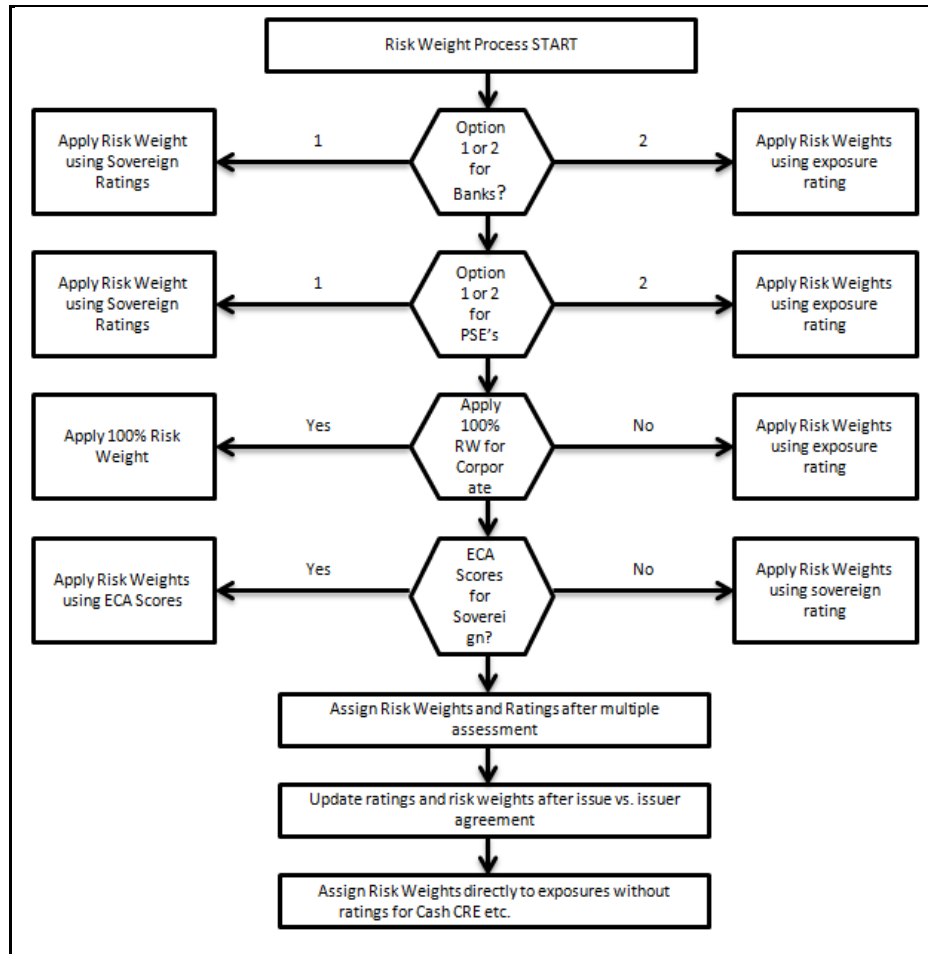
8.2.2.6.3 RWA Calculations

The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight.

8.2.2.7 Credit Risk Mitigation Process

In order to calculate the post CRM RWA, application needs to account for mitigants which may be in the form of collaterals (for simple approach) or guarantees that are being provided by the bank. All the mitigants which get populated into the system are being made ineligible, and then the regulatory approved mitigant types and the issuer type combination are made eligible.

8.2.3 Pooling and Optimizer

8.2.3.1 Pooling

Pooling is one of the pre-requisites for the optimized allocation of the exposures.

Pooling pulls out an exposure, and identifies all the relevant mitigants mapped to it, and the corresponding exposures mapped to these mitigants, and again the corresponding newer mitigants mapped to these exposures. This pooling assigns the cardinality to the exposures based on the mitigant combination.

This happens in the FSI Cap Sub Exposures (FSI_CAP_SUB_EXPOSURES), and the pooling is part of the sub process

The relevant cardinalities that get assigned to the exposures, as part of this pooling process are as follows:

- 1-0➜One exposure not mapped to any mitigant

- 1-1 ➜One exposure mapped to one mitigant

- 1-N➜One exposure mapped to multiple mitigants

- N-1 ➜Multiple exposures mapped to a single mitigant

- N-N ➜Multiple exposures mapped to Multiple mitigants

8.2.3.1.1 Optimizer

The optimizer is the process of allocation of the mitigants to the exposures, based on the different logic applicable for the various granularity. The details of this is available in the Annexure.

Both Pooling and Optimizer is handled under the process **CRM Sub Exposure Pooling and Optimizer Processing.**

8.2.3.2 Post CRM RWA

The application computes the covered amount and the uncovered amount for the exposures. The covered amount is computed by multiplying the covered factor with the exposure amount. To this covered amount, the application assigns the mitigant risk weight. The product of the covered amount and the mitigant risk weight is the covered RWA. The uncovered amount is computed by multiplying the uncovered factor (which is 1 – the sum of all covered factors for that exposure) with the exposure amount. This uncovered amount is multiplied by the exposure risk weight to get the uncovered RWA. The sum of the covered RWA and the uncovered RWA is the Post CRM RWA of the Exposure.

Figure 56: Calculation for Post CRM RWA

Post-CRM RWA = Covered Amount * Risk Weight of the Mitigant
**   + Uncovered Amount * Risk Weight of the Exposure**

This is handled in the process Post CRM Expected and Unexpected Loss RWA Assignment

8.3 Default Fund Contributions Related Capital Charge

A default fund contribution refers to the funds contributed, or commitments made by a clearing member to a Central Counterparty's (CCP) equalized loss-sharing agreement. The purpose of such default funds is to provide capital, in addition to the collateral posted by participants and in addition to capital provided by the clearinghouse, as a safeguard against extraordinary losses that might occur in connection with.

For example, a financial crisis in the market or the simultaneous defaults of several large members. The clearing members contribute to such default funds kept with the central counterparty (clearing house) in the proportion of their exposure to the central counterparty.

The default fund contributions by the clearing members contribute toward the central counterparty's regulatory capital along with CCP's contributions to the default fund. These contributions act as collaterals to mutually share in the losses incurred by the clearing members due to counterparty defaults.

For each clearing member, a contribution is made to the central counterparty's default fund.

This contribution acts as a reliefs against the defaults by any clearing member of the central counterparty.

CRR IV explains the methods that the banking organization playing the part of a clearing member of the CCP, must adopt and compute risk-weighted assets (RWA) for a non-qualifying and a qualifying CCP.

The application handles the treatment of exposures to a QCCP and a Non-QCCP. This qualified CCP flag is expected to be provided as a download in the Party Master (**STG_PARTY_MASTER**) table.

8.3.1   Capital Charge for Non-QCCP

If the CCP is not qualified (Non-QCCP), then the risk-weighted asset amount for the banking organization's default fund contribution is calculated using the Own fund's requirements for pre-funded contributions to the default fund of a non-qualifying CCP approach, as suggested in the accord.

8.3.2   Capital Charge for QCCP

If the CCP is a qualified CCP (QCCP), then the RWA amount is computed using one of the following two approaches stated below. Both are handled in the same Sub-process - RWA For Default Fund Contribution With QCCP. This is based on the run management option selected.

- Own funds requirements for pre-funded contributions to the default fund of a QCCP.

- An alternative calculation of own funds requirement for exposures to a QCCP.

The approach to the use of either the own fund requirements for QCCP or the alternative approach of the own fund requirements for QCCP is based on the run management option.

Approach 1

To compute the clearing member's capital requirement, which is the reporting bank's capital requirement for the contributions made to the CCP's default fund, the hypothetical capital requirement of the central counterparty for the default fund must be known. This must be computed by the central counterparty based on the exposures of all the clearing members to the default fund. After this figure is calculated by the CCP, it is shared with all the clearing members to enable them and to compute their respective capital requirements against the default fund.

When the reporting bank gets the hypothetical capital requirement from the QCCP, the next step is to compute the capital requirement of the reporting bank by finding out the proportion of the reporting bank's contribution in the total default fund contribution.

- The parameters considered for this purpose include the following QCCPs:

- Net potential exposure to the two largest clearing members,

- The total net potential exposure to all the clearing members,

- Total default fund contribution by all the clearing members,

- QCCP's contribution to the default fund, and

- The total number of clearing members for the default fund.

The last step is to compute the risk-weighted assets of the reporting bank corresponding to the default fund contribution to the QCCP by using the capital computed in the previous step.

These steps and the calculation involved are the following:

Step 1:

It requires the QCCP to calculate its hypothetical capital requirement (KCCP) for the default fund. This is done by the QCCP and is published to the clearing members for them to use for their respective capital calculations.

Step 2:

Compare KCCP with the funded portion of the default fund of a QCCP and calculate the capital requirement of the bank (KCM) by using the total of all the clearing members' capital requirements (K*CM). This capital requirement is considered on the contribution that the clearing members make to the default fund of the QCCP.

Approach 2

Capital Charge for the default fund contribution is calculated as follows:

Capital charge (Ki) = 8% * minimum (2% of Trade exposures to the QCCP + 1250% * default fund contribution to the QCCP, 20% * Trade Exposure Amount to the QCCP).

The application also supports the treatment of a CCP stopping to calculate its fund requirement to the CCP. The flag to indicate that the CCP has stopped calculating the own fund requirement is captured in the party table (**STG_PARTY_MASTER**). And based on the supervisory approval provided, in the run management option, the capital will be calculated using the Alternative approach. Else, it is treated as a normal Credit Risk Exposure, part of the Corporate Asset class.

The flag to indicate that the CCP has stopped calculating the capital requirement is expected as part of the Party Master Table (**STG_PARTY_MASTER**). In the case of this flag being null, it is expected that the CCP is calculating the Total Capital and normal processing of QCCP or Non-QCCP happens.

Key Data Elements

Key data elements to be noted are listed in this section. To view the complete list of tables used, see the Download Specification document in [MOS](MOS).

- Default fund contributions and related data are expected at the Default fund – Central Counterparty level in the entity Stage Central Counterparty Details (STG_CCP_DETAILS).

- Hypothetical Capital Requirement of CCP, Maximum Net Potential Exposure of clearing member of CCP, 2nd Maximum Net Potential Exposure of clearing member of CCP, Total Net Potential Exposure of clearing member of CCP, Number of Clearing Members to the CCP, Total funded Default Fund Contribution of all clearing members to the CCP, Total unfunded Default Fund Contribution of all clearing members to the CCP and Default fund contribution of CCP from its funds for each central counterparty level required.

- The application supports only the capital requirement of the bank (KCM) based on Funded/Unfunded default contributions from all clearing members not by Initial Margin. But the data model supports place holders to capture Total Initial Margin by all clearing members to CCP and Bank's initial margin posted to CCP.

8.4 Credit Valuation Adjustments

Basel committee has introduced a new Credit Valuation Adjustment (CVA) capital charge, which is added to the default risk capital charge to arrive at the new Counterparty Credit Risk (CCR) capital charge. The mark to market counterparty credit losses or the spread migration risk is captured with CVA, which was not directly capitalized before. CVA is the difference between the risk-free portfolio value and the true portfolio value that takes into account the possibility of the counterparty's default. In other words, CVA is the market value of counterparty credit risk.

The application calculates CVA Charge for the OTC portfolio of a bank. When using the standardized approach, it is calculated at the portfolio level and for the advanced approach, it is calculated at the counterparty level. CVA Charge does not apply to the trades with a central counterparty and structured finance transactions. Structured financial transactions are applicable only if the supervisor specifically mentions the same.

You can include or exclude structured financial transactions in CVA calculation from the Run Management window. The portfolio level considers all the trades in different OTC products with all counterparties. The charge is calculated for the entire exposure of OTC products.

Counterparty level calculations consider all trades in different OTC products with a counterparty for calculation of CVA Charge. The charge is calculated for all counterparties with which banks have OTC exposures. The CVA charge for all the counterparties is summed up to ascertain the Portfolio Level Charge. The manner of consolidation is dependent on the IMM approval status and Specific Interest Rate (SIR) Value at Risk (VaR) model approval status of the bank. The following section describes two ways of consolidating default risk charge and CVA capital charge:

- If the bank does not have IMM approval and Specified Interest Rate Risk as a part of an approved VaR model for bonds,

CCR Capital Charge = Default Risk Capital Charge (Current Exposure Method or Standardized Method based, whichever the bank is using for CCR) + Standardized CVA Capital Charge

If the bank has IMM approval Specified Interest Rate Risk as a part of the approved VaR model for bonds,

CCR Capital Charge = Default Risk Capital Charge + Advanced CVA Capital Charge

All the OTC Derivatives products are part of CVA calculations. SFTs are included if you select the option from Run Management Window. Also, trades with Central Counterparty (CCP) are excluded from CVA Charge calculations.

8.4.1 Assumptions

CVA hedge must be identified by the clients separately. Only single-name CDS and Index Hedge are eligible for CVA. The Basel III Accord does not mention whether the index hedge position must be marked to the counterparty or not. The Basel Regulatory Capital application handles the index position in the following manner:

- Both index position marked to the level of the counterparty or not marked to the level of the counterparty is handled by the application.

- An effective index hedge amount is considered in the CVA charge calculation at the portfolio level without considering whether it is marked to the counterparty or not.

- If the index position is marked to the counterparty, then index hedge amount is considered while allocating total CVA charge to the counterparty CVA Charge, while using a Standardized Approach.

8.4.2 Process Flow for Credit Valuation Adjustments

This process flow is divided into two sections, for Simple Approach and Advanced Approach.

8.4.2.1 Simple Approach

The application calculates CVA capital charge at a portfolio level using the following formulae as specified by Basel guidelines:

Figure 57: Calculation for Simple Approach of CVA

$$K = 2.33 \cdot \sqrt{h} \cdot \sqrt{\left(\sum_i 0.5 \cdot w_i \cdot \left(M_i \cdot EAD_i^{total} - M_i^{hedge} B_i\right) - \sum_{ind} w_{ind} \cdot M_{ind} \cdot B_{ind}\right)^2 + \sum_i 0.75 \cdot w_i^2 \cdot \left(M_i \cdot EAD_i^{total} - M_i^{hedge} B_i\right)^2}$$

Figure 58: Process Flow for CVA
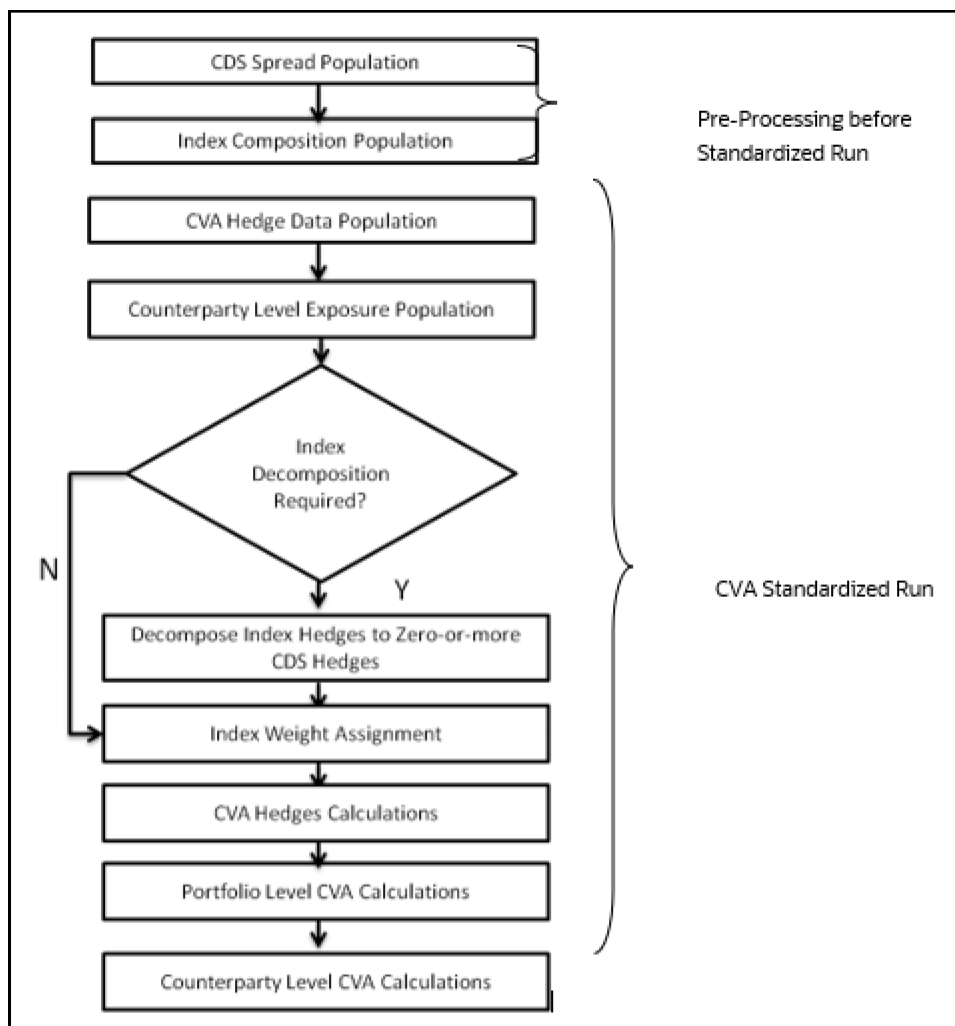
8.4.2.2   CDS Spread Population and Index Composition Population

Pre-processed data for CVA is required to be populated only once for a particular execution date. The process **CVA_DATA_POPULATION** in the Run Staging Data Population - BIS Credit Value Adjustment is responsible for populating pre-processed data for CVA.

8.4.2.3   CVA Hedge Data Population

Mitigants data marked as CVA Hedge is populated as a part of the CVA Hedge Data Population. The application loads all the single-name CDS hedge and index hedge data. The hedge data marked as CVA does not flow in the application during the CCR process. New tables are not added for hedge records; however, a few columns are added to the existing table to capture CVA specific data. CVA specific data is present in the following tables:

- **F_CVA_HEDGE**: Identifier for CVA Hedge records by which the application identifies it as CVA Hedge.

- **N_CDS_INDEX_AVG_SPREAD**: Average traded CDS Index Spread which is required for the assignment of weight to the index.

- **V_REF_ENTITY_PARTY_ID**: This field captures the counterparty of the hedge transaction.

8.4.2.4   Counterparty Level Exposure Population

The application expects the uncovered EAD at the netting agreement level or trade level. This is available as an output of the Current Exposure Method (CEM). If more than one netting agreement is available, then the exposures are summed at the counterparty level. These aggregated data are stored in the **FCT_REG_COUNTERPARTY_CVA** table using **COUNTERPARTY_EXPOSURE_POPULATIO T2T**.

The maturity adjustment discount factor is computed at netting agreement level or for each netting agreement using the formula 1- exp(-0.05*Mi)/ (0.05*Mi).

Maturity is the notional weighted maturity at netting agreement level. The application sums the data for exposure at the counterparty level. If more than one netting agreement is available, the exposures are discounted and then summed at counterparty level. Weight assignment is done based on the counterparty rating as specified in the following table. Data is aggregated at the counterparty level and stored in a separate counterparty table.

Rating	Weight
AAA	0.7%
AA	0.7%
A	0.8%
BBB	1.0%
BB	2.0%
B	3.0%
Lower Than B	10.0%

Unrated	1.0%

8.4.2.4.1 Index Decomposition Required

You can select index decomposition which is executed in the Run Management window. Index decomposition option creates single name CDS hedge positions for the counterparties which are part of the CDS Index and also have exposures. Index hedge amount is adjusted by the same amount for which a single name CDS hedge is created, to get the maximum benefit from hedging. The maturity of the single-name CDS hedge is considered the same as the maturity of the index.

8.4.2.4.2 Index Weight Assignment

The application derives the weight for each index by assigning a rating. Rating is assigned by comparing the historical average spread of index with spread corresponding to the tenor, which is equal to the maturity of the index. After acquiring the rating, assign the weights to the index as per the reference table (weights table). Average index spread and credit spread data for different ratings are the inputs. Index spread is populated as a part of mitigants data. Credit spread data for respective ratings and tenors are required as inputs.

8.4.2.4.3 CVA Hedge Calculations

After the population of hedge data and creation of single-name CDS hedge from the index, the application sums the notional to counterparty level and populates in CVA Specific table. Maturity Adjustment discount factor is computed using the formula (1-exp (-0.05* Mihedge))/ (0.05* Mihedge). If more than one CDS Contract is available for the counterparty, the amount is summed at counterparty level. The Index Hedge amount is calculated separately. Maturity Adjustment discount factor for index position is computed using the formula (1-exp (-0.05* Mind)) / (0.05* Mind). If more than one index hedge is available then index hedge amount is summed. All the data required for CVA calculation is populated from Mitigants data to CVA specific table. The data is summed for every counterparty and stored.

8.4.2.4.4 **Portfolio** Level CVA Calculation

Portfolio Level CVA Charge is calculated as per the following formula:

Figure 59: Calcualtion for Portfolio Level CVA

$$K = 2.33 \cdot \sqrt{h} \cdot \sqrt{\left(\sum_i 0.5 \cdot w_i \cdot \left(M_i \cdot EAD_i^{total} - M_i^{hedge} B_i \right) - \sum_{ind} w_{ind} \cdot M_{ind} \cdot B_{ind} \right)^2 + \sum_i 0.75 \cdot w_i^2 \cdot \left(M_i \cdot EAD_i^{total} - M_i^{hedge} B_i \right)^2}$$

The CVA charge calculated at the portfolio level is populated in the FCT_REG_CVA_SUMMARY table. Single Name CDS Hedge component for CVA at the portfolio level is calculated and the summary table is populated using CVA_SUMMARY_POPULATION T2T.

8.4.2.5 Counterparty Level CVA Calculation

CVA Capital Charge at counterparty level is allocated using the following formula:

CVA at Counterparty = Total CVA at Portfolio *WCVAi

WCVAi = Absolute[0.5*Wi *(Mi * EADitotal - Mihedge * Bi) - $\sum_{indi}$(W$_{ind}$ * M$_{ind}$ * B$_{ind}$)]/

ΣniAbsolute[0.5*Wi * (Mi * EADitotal - Mihedge * Bi) - $\sum_{indi}(\mathbf{W_{ind}} * \mathbf{M_{ind}} * \mathbf{B_{ind}})$]

8.4.2.6 Advanced Approach
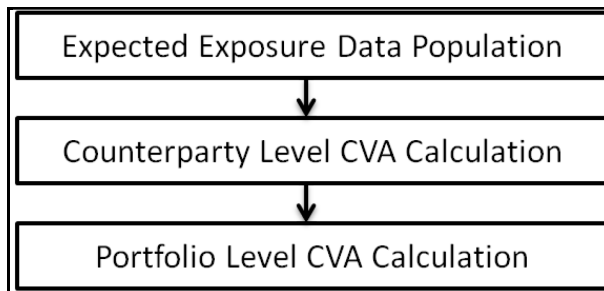
8.4.2.7 Expected Exposure Data Population

The data requirement which is required as input for calculation of CVA Charge using Advance Approach is as follows:

Figure 60: Data Requirement for 8.Expected Exposure Data Population

$$CVA = (LGD_{MKT}) \cdot \sum_{i-1}^{T} Max\left(0; exp\left(-\frac{s_{i-1} \cdot t_{i-1}}{LGD_{MKT}} \right) - exp\left(-\frac{s_i \cdot t_i}{LGD_{MKT}} \right) \right) \cdot \left(\frac{EE_{i-1} \cdot D_{i-1} + EE_i \cdot D_i}{2} \right)$$

LGDMKT: This is the LGD of the counterparty based on the spread of a market instrument of the counterparty. It must be based on market assessment and not an internal estimate. LGD Market must be an input for every counterparty.

Si: This is the credit spread of the counterparty at each tenor Ti, which is used to calculate CVA of the counterparty. Spread data is an input for each counterparty and tenor level.

Ti: This is the tenor at which the Expected Exposure (EE) and spread are provided. The tenor is an input for each EE and spread.

EEi: This is the expected exposure (EE) of the counterparty at revaluation time ti where exposures of different netting agreements of counterparties are added. Expected exposure is input at each counterparty and tenor level.

Di: This is the default risk-free discount factor for each revaluation time bucket. The default risk free rate is an input for each counterparty and tenor ti.

8.4.2.8 Counterparty Level CVA Calculation

CVA RWA calculation at the counterparty level is computed by the following formula:

CVARWA = 12.5*K

Where K= CVA capital charge calculated as per formula specified in Standardized or Advanced method for each counterparty.

The application calculates the CVA Charge at counterparty level using the below formula for two different scenarios:

8.4.2.9 Expected Exposure calculated with Current Market Data

Expected Exposure calculated with Stressed Market Data.

K = 3* (CVAUnstressed VAR + CVAStressed VAR)

The application calculates the CVA Charge at counterparty level using this formula, for every counterparty, and sums the CVA charge for all counterparties to compute portfolio-level capital charge.

The CVA charge calculated at the portfolio level is populated in the FCT_REG_CVA_SUMMARY table.

These aggregated data are stored in the **FCT_REG_COUNTERPARTY_CVA** table using **COUNTERPARTY_EXPOSURE_POPULATIO T2T**.

Portfolio Level CVA Calculation

CVA RWA calculation at the portfolio level is computed using the following formula:

CVARWA = 12.5*K

Where K= CVA capital charge calculated as per formula specified in standardized or advanced method at the portfolio level.

CVA RWA is added to Credit RWA and is not multiplied by the factor 1.06.

8.4.2.9.1 Key Data Elements

Key data elements are provided in this section for computation for Credit Valuation Adjustment. For a complete list of tables and columns to be updated, see the Download Specifications document.

- CDS Index Composition data requirement.

- CDS Spread data for Rating and Tenor.

- Average Index Spread for all the Index Hedge Position.

8.4.2.9.2 Out of Scope

The following is not covered by the application in the computation of Credit Valuation Adjustment:

- Treatment of specific wrong-way risk.

- Treatment of incurred CVA loss

8.5 Underlying Exposures Treatment

UNDERLYING FLOW

Underlying Flow Related to Securitization

The application also supports Underlying exposures that are received as input through Stage Underlying Exposures table (**STG_UNDERLYING_EXPOSURES**). This is relevant for the securitization exposures,

Banking Underlying Exposures

For these exposures, the parent exposures are securitization exposures, mapped via the securitization pool, but the underlying are Banking exposures.

In such cases, exposures will have a record type as **INV_NON_SEC_ULY** (Investment Underlying) and will be populated and processed in the Banking table FSI_CAP_BANKING_EXPOSURES. This is handled in the process **Bank Underlying Data Processing –STD.**

Investment Underlying Exposures

For these exposures, the parent exposures as well as the underlying exposures are both investment exposures. Such exposures will have record type as **INV_NON_SEC_ULY** (Investment Underlying) and will be populated and processed in the Investments table, FSI_CAP_INVESTMENT_EXPOSURES.

This is handled in the similar way as a normal investment exposure in the process **Investment Data Processing – STD**.

Underlying Flow Related to CIU

The application also supports Underlying exposures that are received as input through Stage Fund Underlying Composition table (**STG_FUND_UNDERLYNG_COMPOSITION**). This is relevant for the CIU exposures, the application also supports the underlying composition received as input through the Stage Fund CIS Composition table (STG_FUND_CIS_COMPOSITION)

Investment Underlying Exposures

For these exposures, the parent exposures as well as the underlying exposures are both investment exposures. Such exposures will have record type as **INV_NON_SEC_ULY** (Investment Underlying) and will be populated and processed in the Investments table, FSI_CAP_INVESTMENT_EXPOSURES.

Derivatives Underlying Exposures

For these exposures, the parent exposures are investment exposures, but the underlying are Derivatives exposures. Such exposures will have record type as **INV_NON_SEC_ULY** (Investment Underlying) and will be populated and processed in the Derivatives table FSI_CAP_DERIVATIVES.

This is handled in the process **Derivatives Underlying Data Processing -STD**.

8.6   Credit RWA for Securitization

As per the revised guidelines for securitization framework, which is focused on addressing the short comes of the existing guidelines, a revised hierarchy of approaches that replaces the existing approaches have been introduced.

The application assigns the appropriate approach to the exposures, based on the criteria specified in the Revised guidelines. The application assigns any of the below approaches under securitization standardized approach:

- Sec-External Ratings Based Approach (SEC-ERBA)
- Sec – IAA Approach
- Sec-Standardized Approach (SEC-STD)- SSFA
- Sec 1250% RW

8.6.1.1   Securitization – Revised Framework

The procedure by which the application handles the advanced approach of securitization exposures is as follows:

Figure 61: Process Flow for Securitization – Revised Framework

8.6.2 Rating Population

Credit Rating Process

The entire rating information of the exposures and the mitigants are populated from the staging tables to the processing tables. The exposure and the tranche rating information are captured in the account rating (**STG_ACCOUNT_RATING_DETAILS**) and the instrument rating (STG_INSTRUMENT_RATING_DETAILS)

tables respectively and the mitigant rating information is captured in the instrument rating details (**STG_INSTRUMENT_RATING_DETAILS**) table.

- Account Rating Table (STG_ACOUNT_RATING_DETAILS)

    - Credit Rating for all exposures

- Instrument Rating Table (STG_INSTRUMENT_RATING_DETAILS)

    - Credit Rating for all tranche and mitigants

- Party Rating Table (**STG_PARTY_RATING_DETAILS**)

    - Credit Rating for all issuers are captured in this table.

- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)

    - Credit Rating for all countries is captured in this table.

The Processing Steps are as follows:

Banks obtain credit ratings from different sources and these are provided as an input in the application through the rating tables mentioned in the preceding list.

This is handled in the process **RATING_RECLASSIFICATION_POPULATION.**

The application re-classifies the rating information to BIS Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short Term ratings.

This is handled in the process **Credit Rating Reclassification**.

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables.

Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

Ensure that all the relevant columns as indicated in the DL Specs are mandatorily populated with data. For example, in the Stage Party Rating Details (STG_PARTY_RATING_DETAILS) table: Rating source code (V_RATING_SRC_CODE), Party Code (V_PARTY_CD), Purpose (V_PURPOSE) are required to be populated. The purpose code is to indicate whether the rating is a domestic rating or foreign rating. If any other rating is provided, then the exposure is considered as unrated.

8.6.3 Data Population

8.6.3.1 Pre Processing Steps

Securitization and Mitigant Data Population with Mitigant Mapping

For an investing bank, the data is expected in the Stage Underlying Exposures (**STG_UNDERLYING_EXPOSURES**) for the underlying of the pool, Total Pool Level attributes in the Stage Pool table (**STG_SECURITIZATION_POOL**), Tranche Level attributes in the Stage Tranche table (**STG_SECURITIZATION_TRANCHE**), and the Exposure Level Attributes in the respective PP tables.

For an originator, the data is expected in the same manner as the Investor.

For a credit protection exposure in the form of guarantee, it is expected in the Stage Guarantees table (**STG_GUARANTEES**); and if it is a credit derivative, it is expected in the Stage Credit Derivatives table (**STG_CREDIT_DERIVATIVES**). If it is a regular investment in the Tranches by an investing bank, or it is part of the mandate for retention in the pool or tranche for an originating bank, the data is expected in the Stage Investments table (**STG_INVESTMENTS**).

For a liquidity facility exposure, or servicer cash advance, the exposures are expected in the Stage Commitment Contracts table (**STG_COMMITMENT_CONTRACTS**).

For the securitization hedges done through swaps the exposures are expected in the stage swaps contracts table (STG_SWAPS_CONTRACTS)**.**

This is handled in the process Sec Data Population

With respect to the securitization, the underlying exposures, which are not securitization exposures, follow the process pertaining to the non securitization exposures. The underlying exposures, which are securitization exposures, follow the process pertaining to the securitization exposures.

The mitigants data are populated from the staging table to the processing table. The exposures which are mapped to the mitigants are captured and populated from the staging table to the processing table.

Mitigant data population is handled by the process **MITIGANT_DATA_POPULATION** in BIS Standard run.

Exposure mitigant mapping population is handled in the process **ACCT_MITIGANT_MAPPING_POP**

8.6.4   Shareholding Percent Multiplication

Shareholding percent multiplication for common entity level data is a part of **BIS Common Data Processing** (PMFCOM020) process. In this the application updates the shareholding percentage against each entity. The parent entity is updated with the value of 1 as the shareholding percent and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PCT).

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity with respect to parent entity against exposure amount, undrawn amount and provision amount for that exposure and update the same.

This is handled in the process **Sec Data Population**

8.6.5   Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, it forms an asset class for each exposure is arrived at. Similarly, the application does reclassification for mitigant based on its mitigant types and reclassifies it to standard mitigant types.

Ensure that all products and party type and mitigants which are bank-specific are reclassified, as part of the setup activity. If they are not reclassified, the treatment might not happen as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product types. For Example, Housing Loan is reclassified as Residential Mortgage Exposure.

This is handled in the **Basel Product Type Reclassification** which is part of the COMMON_RECLASSIFICATION.

Party Type Reclassification

Similar to the product type, the customer type (which are stored as counterparty type) are also reclassified as standard counterparty type. The Basel application is designed to include customer type, and legal entity type in a single table (STG_PARTY_MASTER). This is applicable for staging and the dimension model. These are reclassified together as well. Party type reclassification Rules handle reclassification for customer, and entity types. For Example, an Individual is reclassified as Retail.

This is handled in the BIS - Basel Party Type Classification which is part of COMMON RECLASSIFICATION.

This is handled in the Party Type Reclassification which is part of BIS Other Reclassification process.

Mitigant Reclassification

For mitigants the application reclassifies the mitigant type to the standard mitigant type like the debt securities, cash, and so on.

The reclassification tasks are present in the MITIGANT_TYPE_RECLASS_POP sub process.

Other Reclassification

As part of the reclassification rules, any other data which is being brought inside the application like Pool Type, seniority, transaction type and so on also get reclassified into OFSAA specific values. This is also mandatory to be done, as otherwise data will not be available for processing as required by the regulator. This happens as part of the process COMMON_RECLASSIFICATION.

8.6.6   Asset Reclassification Rules

This is applicable only for the underlying exposures. See the banking and investment process.

8.6.7   Due Diligence Requirement for Securitization Exposures

If a banking organization is able to meet due diligence requirements, a Bank can follow any risk weight approach under securitization, to all its securitized exposures, as per the revised hierarchy of approaches. If bank is not able to meet the due diligence requirements, then all the exposures will be risk weighted at 1250%.

The application assigns the appropriate approach to the exposures, based on the criteria specified in the Revised Accord.

This happens in the process SEC_DATA_PROCESSING_STD.

8.6.8   Sec Approach Selection

In the case of banks which follow the standardized approach for their credit risk of Non securitization approaches, the hierarchy is SEC-ERBA, SEC-IAA, SEC-STD and 1250% Risk Weight,

SEC-ERBA (Sec – External Ratings Based Approach) subject to supervisory approval is based on the external ratings assigned to the exposures or the instruments, and also depends on other attributes like the maturity and the tranche thickness.

In case of absence of external rating, the exposures will undergo SEC-IAA (Internal Assessment Approach), based on supervisory approval.

And, if these approaches are not applicable, then the exposures will be assigned a risk weight using SEC-STD Approach.

And if none of the approaches are applicable then the exposures will be assigned a risk weight of 1250%.

This happens part of the sub process SEC_EXPOSURES_METHODOLOGY_ASSIGNMENT under the process SEC_DATA_PROCESSING_STD

8.6.8.1 Pre-mitigation Calculations

The application calculates the Pre-Credit Risk Mitigation (CRM) Exposure at Default (EAD) for each exposure. This value signifies the maximum loss that the bank can suffer, in case of default on this exposure, before considering any mitigation effects.

The application also computes pre-mitigation risk-weighted assets (Pre CRM RWA) and post-mitigation risk-weighted assets (Post CRM RWA) by multiplying the respective EAD by risk weight. The risk weight is arrived using the hierarchy of approaches as suggested above.

8.6.8.2 Exposure at Default Amount Calculation

Exposure at Default (EAD) is calculated using the Exposure Amount (EOP Balance of the Exposure), Undrawn Amount of the Exposure (Undrawn Amount) and also the Credit Conversion Factor for the Off-Balance sheet Amount (CCF). This is computed for the on-balance sheet products separately, and the off balance sheet products separately.

This is handled in the sub process SEC_PRE_CRM_EAD_CALCULATIONS under the process SEC_DATA_PROCESSING_STD.

8.6.8.3 Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment process. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessment are first moved into the table FSI Multiple Rating Processing (FSI_MULTIPLE_RATING_PROCESSING) wherein the ranking and final selection of which rating to use takes place.

This happens in the process of **SEC_MULTIPLE_ASSESSMENT**, under that sub process the application has data transformation separately for exposures and its tranches.

8.6.8.4 Risk Weight Assignment

Sec-External Ratings Based Approach (SEC-ERBA)

If there is a supervisory approval, application continues with the computations else it will look for the next approach.

For exposures that follow the external ratings based approach, the risk weight assignment is based on the criteria used for risk weighting. This is handled as part of the sub process SEC_RISK_WEIGHT_ASSIGNMENT_BASED_ON_RATINGS.

The application uses the seniority position of the exposure, maturity, thickness of the exposure and the credit rating to assign the risk weight to the exposure.

To ensure that the exposures have the risk weight assigned based on their maturity term, the application supports interpolation of the risk weight to accommodate the varying maturity of the exposures.

The DT which is used for interpolation is "Sec_Interpolated_RW" which updates interpolated risk weights for each exposures in "FCT_SEC_EXPOSURES" table. Exposures updated include both "STC condition met" exposures and "STC condition not met " exposures.

This happens in the sub process SEC_INTERPOLATED_RISK_WEIGHT_AND_AVG_EXS_SPRD under SEC_DATA_PROCESSING_STD

Once the risk weights are assigned based on the above-mentioned process the application calculates the SEC_RISK_WEIGHT_CALCULATION under the process SEC_DATA_PROCESSING_STD.

SEC-IAA

Sec IAA is followed in the application based on Internal assessment on the exposures also based on the ABCP indicator. The exposures with that flag enabled F_ABCP_IND will undergo the SEC_IAA approach. The Sec IAA is also to be followed based on the supervisory approval. This SEC-IAA methodology is assigned on the sub process SEC_EXPOSURES_METHODOLGY_ASSIGNMENT.

Once after the approach assignment the application calculates the calculates the Risk weight as part of the sub process SEC_RISK_WEIGHT_ASSIGNMENT_BASED_ON_RATINGS under the process SEC_DATA_PROCESSING_STD and the risk weight calculations are handled in the sub process SEC_RISK_WEIGHT_CALCULATION under the process SEC_DATA_PROCESSING_STD.

Sec-Standardized Approach (SEC-STD)

For exposures following the sec-standardized approach, the application calculates the underlying weighted average capital requirement of the securitization pool (KSA). This is handled at sub process SEC_POOL_CAPITAL_CHARGE_CALCULATION_SA

Other parameters needed for SEC-STD are calculated by the application based on underlying data. This is handled as part of the sub process SEC_TRANCHE_CREDIT_ENHANCEMENT_CALCULATION and the pool level data calculation happens as part of the sub process SEC_POOL_DELINQUENT_BALANCE_CALCULATION.

After all the parameters are calculated, application computes SSFA (Simplified Supervisory formula approach) capital and uses below mentioned logic for risk weight computation. The exposures for which are detachment point (D) less than that of the KA, the exposures are deducted (it will be risk weighted at 1250%). The exposures for which the credit enhancement level is more than that of the KA, the exposures have the KSSFA (SSFA capital charge) computed. The exposures for which the credit enhancement level is less than that of the KA but the sum of the credit enhancement level and the tranche thickness are more than the KA, the exposures are straddled, and that is, the tranche to which the exposure belongs to is split into a position below KA and a position above KA. All the exposures mapped to the straddled tranche are also split by the application in the same proportion as the split tranche. Post straddling risk weight is computed using the computation logic mentioned by the accord.

This happens as part of the sub process SEC_TRANCHE_PARAMETER_CALCULATIONS.

For the calculation of Risk weight under standardized approach (SEC_STD) the below sub processes in the application calculates the respective values mentioned above in the processing table for each exposures. This happens part of the sub process SEC_SA_PRE_CRM_CAPITAL_CALCULATION under the process SEC_DATA_PROCESSING_STD

Maximum RW for Exposures

Maximum risk weight requirements for senior exposures for all the pools is handled by the application as per the logic given in the accord.

For Maximum capital requirement, in order to apply a maximum capital charge to a bank's securitization exposure, the following inputs are required: The largest proportion of interest that the bank holds for each tranche of a given pool (P). In particular: – For a bank that has one or more securitization exposure(s) that reside in a single tranche of a given pool, P equals the proportion (expressed as a percentage) of securitization exposure(s) that the bank holds in that given tranche (calculated as the total nominal amount of the bank's securitization exposure(s) in the tranche) divided by the nominal amount of the tranche. For a bank that has securitization exposures that reside in different tranches of a given securitization, P equals the maximum proportion of interest across tranches, where the proportion of interest for each of the different tranches must be calculated as described above.

This happens in the sub process SEC_POOL_TRANCHE_PARAMETERS_UPDATE_EXPOSURES under the process SEC_DATA_PROCESSING_STD

If none of the approach is applicable for the exposures, then 1250% Risk Weight will be applicable. This approach assignment happens part of the sub process SEC_EXPOSURES_METHODOLOGY_ASSIGNMENT under the process SEC_DATA_PROCESSING_STD. Once after the above sub process the risk weight calculation will happen based on the Sec 1250% risk weight in the sub process SEC_RISK_WEIGHT_CALCULATION under the process SEC_DATA_PROCESSING_STD.

Re-securitized exposures

Re-securitized exposures are the exposures which are issued out of a pool of underlying exposures which constitutes non-securitized exposures and some portion of securitized exposures. Application is capable of handling both securitized exposures and re-securitized exposures.

The securitized underlying of the re-securitization pool will be captured in the. Stage underlying Exposures (STG_UNDERLYING_EXPOSURES). As per the revised framework, the approach that should be used for risk weight calculation is standardized approach only, no other approaches are applicable. The application assigns the same approach based on the re-securitization flag. For these exposures parameters that are used in standardized approach are calculated for both non-securitized and securitized exposures using the logic mentioned in the revised accord.

This happens in the sub process RESEC_POOL_RW_CALCULATIONS under the process SEC_DATA_PROCESSING_STD.

STC Transactions (STC Transaction)

As per the revised Basel guidelines the transactions with simplicity means the homogeneity of the underlying assets belong to same products / characteristics and simple in nature which have the transparency of the underlying assets, the details of the transactions are with sufficient information also they are easily comparable against the equivalent transactions. The eligibility of these conditions is checked for the transactions and these transactions are handled separately by the application

This is in the sub process SEC_ELIGIBILITY_FOR_STC_TRANSACTIONS under the process **SEC_DATA_PROCESSING_STD.** Once the Eligibility conditions are checked for the exposures based on the above sub process the respective exposures are handled in the downstream sub process in the application which are stated above under various approaches.

Sec Pre-CRM RWA Computation

The application calculates the Pre-CRM RWA for the exposures by multiplying the Pre-CRM EAD with the risk weight of the exposures. Pre-CRM RWA is computed in the Sec Pre-CRM RWA Computation sub process.

This is handled in application under SEC_PRE_CRM_CAPITAL_CHARGE

8.6.8.5   Credit Risk Mitigation Process

In order to calculate the post CRM RWA, application needs to account for mitigants which may be in the form of collaterals, guarantees, credit derivatives. Not all mitigants are eligible for RWA computation. All the mitigants which get populated into the system are being made ineligible, and then the regulatory approved mitigant types and the issuer type combination are made eligible in Mitigant Processing.

Mitigant Data population

Mitigant data is loaded from the Stage Mitigant table (STG_MITIGANTS) into the FSI CAP Mitigants table (FSI_CAP_MITIGANTS) where further processing takes place. This is takes place under the process **Mitigant Data Population.**

Mitigant Multiple assessment

Similar to exposures with multiple ratings, mitigants with multiple ratings are also subject to Multiple rating Assessment. This is handled under the sub-process **Mitigant Multiple Rating Assignment – BIS.**

All the guarantees and credit derivatives issued by issuers that are reclassified as Other Entities are treated as eligible for Securitization exposures if they satisfy the current rating and the original rating criteria specified by the Basel accord. For processing the original rating of these issuers, the application performs the multiple assessments of the initial ratings.

The Data Transformation "CAP_MITIGANT_MULTIPLE_ASSESSMENT_DATA_POP" performs this.

8.6.8.5.1   Mitigant Eligibility Approaches and their Risk Weighting Rules

Mitigant Risk Weight

For Simple approach, the application assigns risk weight to mitigants on the basis of credit rating (**CAP Mitigant Basel Rating and Risk Weight Assignment**), original maturity (**CAP Mitigant RW Assignment based on Original Maturity**). These fall under the process **Mitigant RW Assignment – Simple –BIS**.

Similarly, for Comprehensive approach, mitigant risk weights are assigned on the basis of credit rating (**CAP Mitigant Basel Rating and Risk Weight Assignment**), for financial collaterals (**CAP Mitigant RW Assignment for Financial Collaterals - Comprehensive Approach**). These fall under the process **Mitigant RW Assignment – BIS –Comprehensive Approach.**

Mitigant Eligibility

The application identifies the eligible mitigants based on the criteria as mentioned by the Regulator. The application identifies the following standard mitigants– collateral, guarantees, and credit derivatives.

The application is capable of using the Simple Approach and the Comprehensive Approach for the mitigants which are part of the collateral. The application identifies the eligibility of the financial collateral separately for the simple approach and the comprehensive approach. The eligibility of the collateral mitigants are based on the party type of the mitigant, mitigant types, the credit rating assigned to the mitigant or the party (as applicable), and the classification of collateral as senior or not.

This is handled in CAP Mitigant Eligibility for Equity - Simple approach under the process **Mitigant Collateral Eligibility Simple Approach -BIS**

For mutual funds, the eligibility is based on the eligible mutual fund indicator. This is handled in **CAP Mitigant Eligibility for Mutual Fund - Simple approach** under the process **Mitigant Collateral Eligibility Simple Approach -BIS**

The application also identifies whether the mitigant is a Re-securitized exposure and if yes, makes it ineligible.

This is handled in **CAP Collateral Eligibility - Simple Approach** under the process **Mitigant Collateral Eligibility Simple Approach -BIS**

The application identifies the eligibility of the guarantees and credit derivatives based on the party type of the mitigant and the credit rating assigned to the issuer of the mitigant. This is handled in the process **Mitigant Collateral Eligibility Simple Approach –BIS.**

Similar mitigant eligibility rules for Comprehensive Rule can be found in the process **Mitigant Collateral Eligibility – Comprehensive Approach –BIS**.

The option for the bank to select Collateral Simple Approach or Comprehensive Approach is based on the Run Management option as selected in the UI.

8.6.8.5.2   Mitigant Haircut Assignment

Under Standardized approach, the bank has to follow supervisory estimates for Mitigant Haircut assignment. This is based on the various categories like mitigant type, residual maturity, rating, issuer type and so on. This is applicable only if the bank follows comprehensive approach for collateral.

Only eligible mitigants are considered for haircut assignment and for further processing. Post haircut assignment, the eligible mitigants are moved from mitigants table (FSI_CAP_MITIGANTS) to sub exposures table (FSI_CAP_SUB_EXPOSURES).

The application does computations for three kinds of mitigant haircuts which are volatility haircut, FOREX haircut, and maturity mismatch haircut.

Volatility Haircut

Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. The application assign haircuts for various type of financial collateral like debt securities, equity, mutual funds, and so on. In the supervisory haircut method, the application assigns volatility haircut based on issues, issuer's ratings, mitigant's residual maturity, and type of mitigant.

This is handled in **CAP CRM Mitigant Volatility Haircut - Supervisory Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

Forex Haircut

If the exposure and collateral are in different currencies, then the application makes an adjustment by applying the FOREX haircut.

This is handled in **CAP CRM Forex Haircut Sub Exposures** under **CRM Sub Exposure Data Haircut Assignment** process.

Maturity Mismatch Haircut

If the residual maturity of the Credit Risk Mitigant is less than that of the underlying credit exposure, then a maturity mismatch haircut is applied to adjust the value.

This is handled under **CAP CRM Maturity Mismatch Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

8.6.9 Pooling and Optimizer

8.6.9.1 Pooling

Pooling is one of the pre-requisite for the optimized allocation of the exposures.

Pooling pulls out an exposure, and identifies all the relevant mitigants mapped to it, and the corresponding exposures mapped to these mitigants, and again the corresponding newer mitigants mapped to these exposures. This pooling assigns the cardinality to the exposures based on the mitigant combination.

This happens in the FSI Cap Sub Exposures (FSI_CAP_SUB_EXPOSURES), and the pooling is part of the sub process

The relevant cardinalities that get assigned to the exposures, as part of this pooling process are as below:

- 1-0➔One exposure not mapped to any mitigant
- 1-1 ➔One exposure mapped to one mitigant
- 1-N➔One exposure mapped to multiple mitigants
- N-1 ➔Multiple exposures mapped to a single mitigant
- N-N ➔Multiple exposures mapped to Multiple mitigants

8.6.9.2 Optimizer

The optimizer is the process of allocation of the mitigants to the exposures, based on the different logic applicable for the various granularity. For more information, see Annexure.

Both Pooling and Optimizer is handled under the process **CRM Sub Exposure Pooling and Optimizer Processing.**

8.6.9.3 Post CRM RWA Computation

The application computes the covered amount and the uncovered amount for the exposures. The covered amount is computed by multiplying the covered factor with the exposure amount. To this covered amount, the application assigns the mitigant risk weight. The product of the covered amount and the mitigant risk weight is the covered RWA. The uncovered amount is computed by multiplying the uncovered factor (which is 1 – sum of all covered factors for that exposure) with the exposure amount. This uncovered amount is multiplied by the exposure risk weight to get the uncovered RWA. The sum of the covered RWA and the uncovered RWA is the Post CRM RWA of the exposure.

8.7 Market Risk RWA

The Basel Committee has introduced Market Risk Capital Charge calculation in 1996 as an amendment to the earlier Basel accord by considering the risk borne by a financial institution having exposures in the trading book. BIS defines Market Risk as "the risk of losses in the on and off-balance-sheet positions arising from movements in market prices". It is the risk that arises out of the adverse movements of the market factors. Market risk consists of the risk borne by the bank due to the positions in its trading book.

Basel outlays two basic approaches for calculating the capital charge for Market Risk:

- Standardized Approach

- Internal Model Method Approach

8.7.1   Standardized Approach

In standardized approach (STD Approach), the Market Risk Capital Charge is calculated for the following instrument types:

- Interest Rate related Instruments (IR Instruments)

- Equity Position Risk

- Foreign Exchange Risk

- Commodities

- Options

Prerequisite for MR Processing

Execution of the Run, Staging Data Population - Market Risk - BIS Standardized Approach is usually a onetime activity. This must be executed once before actual Market Risk Run is executed. This Run is expected to execute in following circumstances. The following tasks are performed when the Run is executed.

- Interest Rate Curve Data

- Market prices of the instruments

- Bank positions

This Run populates the instrument level data that is required by the actual Run for further processing. The instrument level data such as number of units of the instruments on that particular MIS date is downloaded in bank instrument position (**STG_BANK_POSITIONS**) table. This data flows into the fact table for further processing. The OTC instrument price is expected as a download. For non-OTC instruments the data for instruments' price is captured in Market Instrument Contract (**STG_MKT_INSTRUMENT_CONTRACT**) table. This data further flows into the fact table.

For IR instruments, the interest rate required is captured in IRC Rate History (**STG_IRC_RATE_HIST**) table. This data further flows into the fact table. This data is required for term structure that is used in Modified Duration and Greeks Parameter calculation for options.

Process Flow for Market Risk - Standardized Approach

The following pre-defined Run can be executed to compute Market RWA using the Standardized Approach.

Run: Risk-weighted Asset Calculation - Market Risk - BIS Standardized Approach
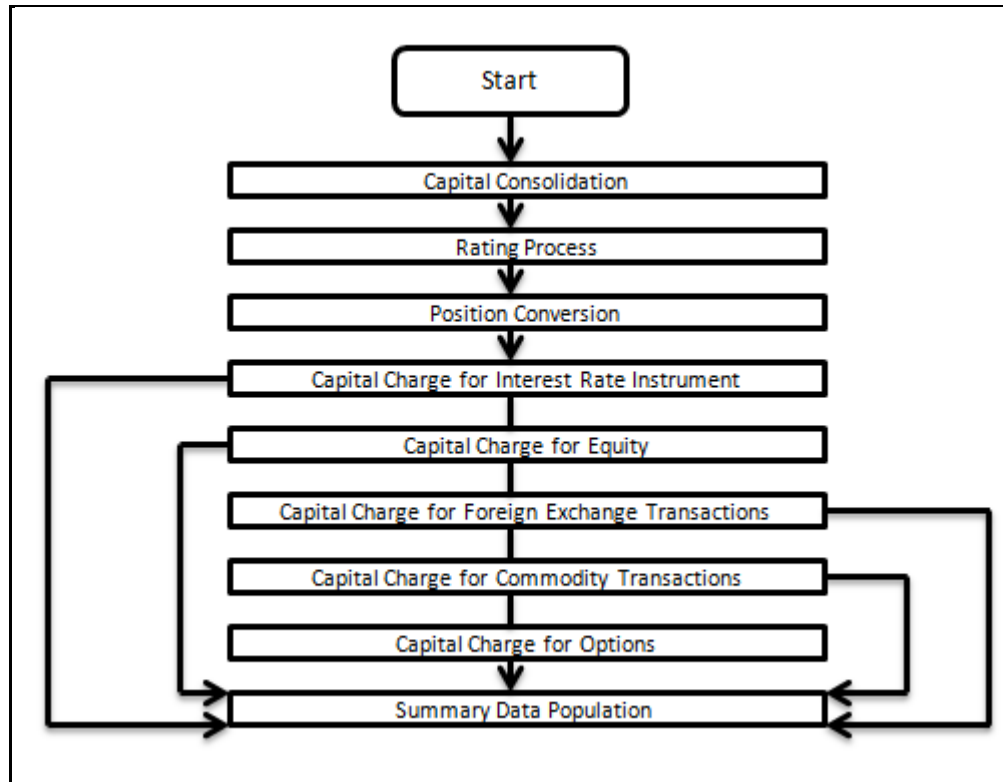
For more information on the computation of Market Risk using the Standardized and IMM approaches, see **Error! Reference source not found.**.

8.7.2   Data Population

The application populates Market Risk Exposures (FCT_MARKET_RISK_EXPOSURES) table with the details provided by the bank in Stage Bank Positions (STG_BANK_POSITIONS) table and Stage Instrument Contract Master (STG_INSTRUMENT_CONTRACT_MASTER) table. FOREX exposures of the bank are populated into Market Risk FOREX (FCT_MARKET_RISK_FOREX). This exercise is done for all the trading book exposures.

For more information on processes and sub processes that compute this:

- Process: MKT_RISK_POSITION_CONVERSION

- Sub-process: Market Risk Data Population

8.7.3   Shareholding Percent Multiplication

For consolidated runs, exposures of the child entities are multiplied by the entity shareholding percentage to arrive at the consolidated exposure at the parent level.

For more information on processes and sub processes that compute this, see the following:

- Process: MKT_RISK_POSITION_CONVERSION

- Sub-process: Shareholding Percent Multiplication

8.7.4   Currency Conversion

All the positions in other currencies are converted into the reporting currency of the bank, based on the currency conversion rate between the exposure currency and reporting currency.

For more information on processes and sub processes that compute this, see the following:

- Process: MKT_RISK_POSITION_CONVERSION

- Sub-process: Currency Conversion

8.7.5   Common Reclassification Rules

The application reclassifies all bank instruments into standard instrument types based on contract type, contract position, market risk position, and so on. A fixed bond forward with a long position in the contract is reclassified into fixed rate bond for the long leg and zero risk security for the short leg created by position conversion. The reclassifications are then used for notional value calculation.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_POSITION_CONVERSION

Sub-process:

- Position Conversion Exotic Options

- Position Conversion Options

- Position Conversion Basket Futures - Interest Rate

- Position Conversion Swaps

- Position Conversion Forwards and Futures

- Position Conversion Credit Derivatives

8.7.6   Offset Exposure Amount Calculations

After Notional Value calculation, the application assigns risk weights to the position converted IR-instruments. The risk weights are stored in Specific Risk Mapping table. These risk weights are stored against time band, Basel rating and category surrogate keys. The categories are Qualifying and sovereign and the ratings are picked from standard Basel Rating table.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_POSITION_CONVERSION

Sub-process:

- Market Risk Specific Risk IR Assignment

- Market Risk CD Underlying Specific Risk

There is some dependency on different instrument types, like exotic options which can further result into a vanilla option after position conversion. Therefore, position conversion of instrument types must be processing in the following order:

- Exotic Options

- Options.

- Basket Futures

- Swaps

- Forwards Futures

- Credit Derivatives

After position conversion of Basket Futures instrument types, position offsetting is performed on different positions of same kind of instrument types and the post offset exposure amount is arrived at.

Example of a Forward Rate Agreement (FRA) Position Conversion:

A purchased FRA can be depicted through two notional zero-coupon positions: one short position (liability) up to the maturity of the underlying credit transaction and one long position (claim) up to the settlement of the FRA. Suppose a firm purchases 3 x 6-month FRA, principal: 1000; interest rate 6%. The previous position is broken down into two opposite zero-coupon bond positions as follows:

- First Position:

  Position   : Long

  Value of Notional Position   : PV {1000/ ((1+5%) ^0.25) = 987.87}

  Maturity   : 3 months

  Coupon   : Zero (Coupon of less than 3%)

- Second Position:

  Position   : Short

  Value of Notional Position   : PV {1000/ ((1+5%) ^0.5) = 975.90}

  Maturity   : 6 months

  Coupon   : Zero (Coupon of less than 3%)

A sold FRA has positions exactly opposite to the one given in the preceding example, that is, the long position income short and short position income long, with the value, maturity, and coupon remaining the same.

Taking the preceding example into consideration, it must be noted that the actual discount rates for discounting the notional values of the two legs, is the interest rates pertaining to the respective maturities, that is, 3 months (long leg) and 6 months (short leg). For simplification purposes, an assumed rate of 5% is considered in the preceding example. Taking the preceding example into consideration, the steps processed in the application are as follows:

- The FRA as a contract is captured in the contract record details table with the banks position in the contract in the position table. The application also captures the position mapping table for the instrument type which is used for position conversion under data population as detailed in the high-level Market Risk process flow. For the previous FRA example, two positions are created, one long position with a maturity of 3 months and a short position for the life of the contract that is, with a maturity of 6 months.

- Both the position legs are reclassified into zero specific risk security.

- The various contract parameters are assigned by the application to both the legs. Example: Coupon Rate, Maturity.

- The notional value of both the legs is calculated as per the logic stated in the example.

8.7.7   Position Conversion

Position conversion is processed before Capital Charge calculation under Market Risk. In Position Conversion, different instruments are broken into long and short positions and carried forward for specific and general risk charge calculation. All derivative instruments undergo position conversion so that the instrument is broken down into simplified positions for further processing. For derivative positions in equities, commodities, gold, currencies, and so on, only one leg is exposed to interest rate and other leg is exposed to the respective asset (equity, FOREX) as the case may be. The following information is required for position conversion: Long or Short position, Value of Notional Position, Coupon Rate, and Maturity.

Methodology for Position Conversion

While calculating interest rate risk, each instrument is converted into multiple positions. The notional value of each position is derived based on the following methodology:

Notional positions in actual debt securities are valued as the nominal amount underlying the contract at the current market price of the debt security.

Positions in zero-specific-risk securities is valued using one of the following two methods:

- The present value approach, under which the zero specific-risk security is assigned a value equal to the present value of all the future cash flows that it represents or

- The alternative approach, under which the zero specific-risk security is assigned a value equal to the market value of the underlying notional equity position in the case of an equity derivative; the notional principal amount in the case of an interest rate or foreign currency swap; or the notional amount in the case of any other financial instrument

For options, the delta weighted values go into the general risk charge calculation. Delta is computed by the application based on the instrument type, coupon, residual maturity, strike price, spread, option premium value, and so on.

For an Interest Rate (IR) Swap, the parent instrument is identified as a Receiver or Payer swap based on whether the bank is receiving fixed or paying fixed, respectively. After Position Conversion, the parent swap is converted to two child positions which is in zero specific risk securities. The exposure amount for each of these positions is computed based on the coupon rate of receiving leg for the long child position and the coupon rate of the paying leg for short child position. Currently the notional amount for both the child positions is being computed using the current market price column of the parent.

- Instrument Coverage

- Interest Rate Derivatives

  - Bond Forward

  - Forward Rate Agreement

  - Bond Future

  - Future on a Basket/Index of bonds

  - Interest Rate Futures

- Receiver Swap (without deferred start)
- Payer Swap (without deferred start)
- Basis Swap (without deferred start)
- Forward Basis Swap
- Forward Receiver Swap
- Forward Payer Swap
- Dual Currency Bond

- Equity Derivatives
  - Equity Forward
  - Equity Future
  - Equity Swap

- Currency Derivatives
  - Currency Forward
  - Currency Future
  - Currency Swap

- Commodity Derivatives
  - Commodity Forward
  - Commodity Future
  - Commodity Swap
  - Gold Forward

- Credit Derivatives
  - Credit Default Swap
  - Total Rate of Return Swap
  - Cash Funded Credit Linked Notes
  - First and Second-to-Default Basket Credit Derivatives

- Options / Structured Products
  - Option on Equity
  - Option on Currency
  - Option on Commodity
  - Option on Currency Future
  - Option on Currency Forward
  - Currency Swaption
  - Option on a bond

- Option on a bond future

- Option on a Forward Rate Agreement

- Option on an Interest Rate Future

- Caps

- Floors

- Collars

- Swaptions

- Bonds with Embedded Swaptions

- Callable Bonds

- Putable Bonds

- Floating Rate Notes with Caps

- Floating Rate Notes with Floors

- Reverse Floaters

- Leveraged Floaters

Position Conversion - Process Flow

The process flow of Market Risk Position Conversion is as follows:

Figure 62: Process Flow for Position Conversion
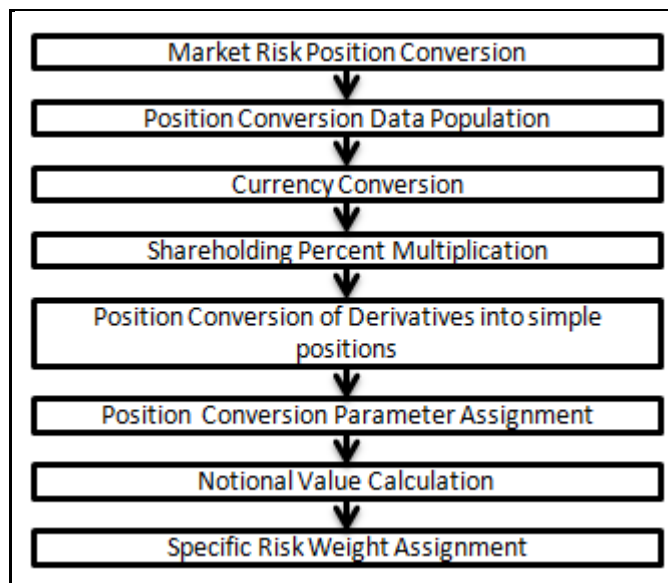
Position Conversion Data Population

The application populates Market Risk Exposures (**FCT_MARKET_RISK_EXPOSURES**) table with the details provided by the bank in Stage Bank Positions (**STG_BANK_POSITIONS**) table and Stage Instrument Contract Master (**STG_INSTRUMENT_CONTRACT_MASTER**) table. FOREX exposures of the bank are populated into Market Risk FOREX (**FCT_MARKET_RISK_FOREX**). This exercise is done for all the trading book exposures.

For more information on processes and sub processes that compute this:

Process: MKT_RISK_POSITION_CONVERSION

Sub-process: Market Risk Data Population

Position Conversion of Derivatives into Simple Positions

The application takes the contract details from instrument table and breaks each contract into multiple positions into market risk exposures (FCT_MARKET_RISK_EXPOSURES) table. The application splits instruments, which are derivatives in nature, into multiple positions based on the instrument position mapping available in the mapping table. For example: A bank having a plain long position in a derivative instrument is split into one long and one short position. Hence for each position and nature of contract type, the application creates the required number of positions in the processing table. The download information used for position conversion is contract details, instrument type, contract position, position mapping, and so on.

Certain exotic instruments are split into more than two positions. For example: A long position in a reverse floater is converted into the following positions.

- A long position in two straight bonds (double the notional amount and half the fixed interest rate);

- A short position in a floating rate bond (a position in floating rate bond with notional amount and floating reference rate);

- A long position in a cap (which is further broken down into its underlying positions).

The application reclassifies all bank instruments into standard instrument types based on contract type, contract position, market risk position, and so on. A fixed bond forward with a long position in the contract is reclassified into fixed rate bond for the long leg and zero risk security for the short leg created by position conversion. The reclassifications are then used for notional value calculation.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_POSITION_CONVERSION

Sub-process:

- Position Conversion Exotic Options

- Position Conversion Options

- Position Conversion Basket Futures - Interest Rate

- Position Conversion Swaps

- Position Conversion Forwards and Futures

- Position Conversion Credit Derivatives

Position Conversion Parameter Assignment

After position conversion, that is, breaking each derivative instrument into long and short leg, the application assigns instrument parameters for each position leg created under position conversion logic. For each leg, relevant information like: coupon rate, coupon frequency, maturity, strike price for options, option premium value, and so on are updated from parent information. This information is used in identifying instruments to be grouped under maturity ladder based on coupon rate (less than or greater than equal to 3%), duration calculation for duration ladder approach, calculation of Greeks for option charge, and so on.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_POSITION_CONVERSION

Sub-process:

- Position Conversion Exotic Options

- Position Conversion Options

- Position Conversion Basket Futures - Interest Rate

- Position Conversion Swaps

- Position Conversion Forwards and Futures

- Position Conversion Credit Derivatives

Notional Value Calculation

Notional value of each leg created by position conversion for each instrument is calculated based on the contract characteristics (market price, number of units). For options it is the delta weighted position which is carried forward for market risk charge calculation.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_POSITION_CONVERSION

Sub-process:

- Position Conversion Exotic Options

- Position Conversion Options

- Position Conversion Basket Futures - Interest Rate

- Position Conversion Swaps

- Position Conversion Forwards and Futures

- Position Conversion Credit Derivatives

Specific Risk Weight Assignment

After Notional Value calculation, the application assigns risk weights to the position converted IR-instruments. The risk weights are stored in Specific Risk Mapping table. These risk weights are stored against time band, Basel rating and category surrogate keys. The categories are Qualifying and sovereign and the ratings are picked from standard Basel Rating table.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_POSITION_CONVERSION

Sub-process:

- Market Risk Specific Risk IR Assignment

- Market Risk CD Underlying Specific Risk

There is some dependency on different instrument types, like exotic options which can further result into a vanilla option after position conversion. Therefore, position conversion of instrument types must be processing in the following order:

- Exotic Options

- Options.

- Basket Futures

- Swaps

- Forwards Futures

- Credit Derivatives

After position conversion of Basket Futures instrument types, position offsetting is performed on different positions of same kind of instrument types and the post offset exposure amount is arrived at.

Example of a Forward Rate Agreement (FRA) Position Conversion:

A purchased FRA can be depicted through two notional zero-coupon positions: one short position (liability) up to the maturity of the underlying credit transaction and one long position (claim) up to the settlement of the FRA. Suppose a firm purchases 3 x 6 month FRA, principal: 1000; interest rate 6%. The previous position is broken down into two opposite zero coupon bond positions as follows:

- First Position:

  Position   : Long

  Value of Notional Position   : PV {1000/ ((1+5%) ^0.25) = 987.87}

  Maturity   : 3 months

  Coupon   : Zero (Coupon of less than 3%)

- Second Position:

  Position   : Short

  Value of Notional Position   : PV {1000/ ((1+5%) ^0.5) = 975.90}

  Maturity   : 6 months

  Coupon   : Zero (Coupon of less than 3%)

A sold FRA has positions exactly opposite to the one given in the preceding example, that is, the long position is come short and short position is come long, with the value, maturity, and coupon remaining the same.

Taking the preceding example into consideration, it must be noted that the actual discount rates for discounting the notional values of the two legs, is the interest rates pertaining to the respective maturities, that is, 3 months (long leg) and 6 months (short leg). For simplification purposes, an assumed rate of 5% is considered in the preceding example. Taking the preceding example into consideration, the steps processed in the application are as follows:

- The FRA as a contract is captured in the contract record details table with the banks position in the contract in the position table. The application also captures the position mapping table for the instrument type which is used for position conversion under data population as detailed in the high level Market Risk process flow. For the previous FRA example, two positions are created, one long position with a maturity of 3 months and a short position for the life of the contract that is, with a maturity of 6 months.

- Both the position legs are reclassified into zero specific risk security.

- The various contract parameters are assigned by the application to both the legs. Example: Coupon Rate, Maturity.

- The notional value of both the legs is calculated as per the logic stated in the example.

Capital Charge for Interest Rate Instruments

- The total risk charge for Interest Rate (IR) instruments consists of specific risk charge (specific to the issuer and instrument) and general risk charge (market related risk vested in the instrument).

- The process flow for Interest Rate Risk is as follows:

Figure 63: Process Flow for Interest Rate Risk

Specific Risk Charge Calculation

Specific risk charge is calculated based on the categories and investment grade. The application first identifies the categories based on the conditions laid by the accord. After the category is identified the specific charge weight is assigned based on category, Basel equivalent rating, and residual maturity.

The specific risk weight is assigned under the Market Risk position conversion process. These specific risk weights are then multiplied by the exposure amount arrived at after position offset to eventually compute specific risk charge for Interest Rate instruments.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_STD_APPROACH

Sub-process: Market Risk Specific Risk Charge Calculation - IR and Equity

8.7.8 General Market Risk Charge Calculation

General Risk charge is calculated for each interest rate risk exposure for a reporting bank. General Risk charge is calculated based on two methods:

- Maturity Ladder Approach

- Duration Ladder Approach

Under both the methods, the application creates time bands and based on Residual Maturity or Modified Duration, places each instrument in the respective time bands for offsetting. The matched and unmatched

position across time bands and across three zones attracts general risk charge as per the definition stated in guidelines for market risk.

Residual Maturity Ladder

Under the Maturity Ladder approach, the general risk charge is calculated for each currency. For multiple currencies, the horizontal and vertical disallowance is calculated by creating separate residual maturity ladder for each currency unless the interest rate risk exposures are insignificant for the reporting bank. In the case of insignificant exposures in multiple currencies, exposures are grouped into a single residual maturity ladder for general risk charge calculation.

Under Residual Maturity Method, the application initially creates around 15 residual maturity time bands. The time band definitions, provided in the Basel II guidelines, are based on the coupon being less than 3% or equal to and greater than 3%. All the 15-time bands are grouped to 3 zones for horizontal disallowance as per the zone definition given in Basel II Market Risk guidelines. This is computed under the process 'MR Time Band Reclassification – Maturity Approach'. Based on the time bands, positions are assigned general risk weights. The delta-weighted positions of IR options are considered for the slotting into time bands and zones.

The entire end to end processing of general risk charge is calculated in a separate table (**FCT_MARKET_RISK_CAPITAL**) meant specifically for it and can be selected and analyzed in the form of reports. All the processing steps and related data are stored in the table starting from weighted long and short positions, matched and unmatched positions following horizontal and vertical disallowance, and net open position by each currency.

For more information on processes and sub processes that compute this, see the following:

> Process: MKT_RISK_STD_APPROACH

> Sub-process: Time Band Reclassification - Maturity Approach

Duration Ladder

Under the Duration Ladder approach, the application creates Duration Ladder based on the modified duration calculated for each instrument. Similar to Maturity Ladder, the general risk charge under Duration Ladder is also calculated for each currency and insignificant positions across multiple currencies are put into a single modified duration ladder for horizontal and vertical disallowance calculation.

The duration ladder time band created in the application is based on the definition provided in the Basel II guidelines on Market Risk. Like Residual Maturity, for Duration Based Ladder approach the application creates three time zones for each modified duration time band. This is computed in the process 'MR Time Band Reclassification - Duration Approach'. Based on the time bands, positions are assigned an 'assumed rate'. The delta-weighted positions of IR options are considered for the slotting into time bands and zones.

All the processing attributes used under the Duration Ladder Approach are stored in a separate table (**FCT_MARKET_RISK_CAPITAL**) starting from weighted long and short positions, matched and unmatched positions following horizontal and vertical disallowance, and net open position by each currency.

For more information on processes and sub processes that compute this, see the following:

> Process: MKT_RISK_STD_APPROACH

> Sub-process: Time Band Reclassification - Duration Approach

Horizontal/Vertical Disallowance

In the application, vertical and horizontal disallowance for IR instruments under Maturity and Duration Approach is computed by using a Data Transformation function 'Mkt_Risk_GenRsk_IR' under 'Market Risk General Risk Charge Calculation – IR and Equity'. This computes the matching of the positions within time bands, zones, across adjacent zones, and across non-adjacent zones to finally arrive at the general risk charge for interest rate instruments.

The capital charge is applied at each state for the matched and unmatched position as per the capital charge stated in Basel II guidelines for Market Risk. The procedure followed by the application which handles the horizontal and vertical disallowance is provided in the following section. This process remains same across the Maturity Ladder and Duration Ladder Approaches.

- The application initially populates weighted long and weighted short position amounts for each time band.

- The application offsets the matched positions and populates them as 'offset matched position within the time band'. The unmatched positions are populated as 'offset unmatched position within the time band'.

Offset unmatched positions arrived at from the previous step are then considered for offsetting within a time zone. All the 'offset unmatched positions within time band' falling under the same zone are offset with each other and 'offset match same zone' and 'offset unmatched same zone are computed'.

Offset unmatched positions within same zone are then carried forward for calculating 'offset matched between zone' and 'offset unmatched between zones'. This is first processed for zones 1 and 2, further for zones 2 and 3, and lastly for zones 1 and 3.

All the unmatched positions (within time band, same zone, between zones and net unmatched position) are multiplied by the factors listed in the Basel accord for Maturity and Duration approach as applicable.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_STD_APPROACH

Sub-process: Market Risk Generic Risk Charge Calculation - IR and Equity

Procedure: Mkt_Risk_GenRsk_IR

Summary Output

For reporting purposes, the application moves data from market risk capital (**FCT_MARKET_RISK_CAPITAL**) table to market risk reporting (**FCT_MARKET_RISK_REPORTING**) table.

Finally, RWA is calculated in Market Risk Summary (**FCT_MARKET_RISK_SUMMARY**) table by multiplying capital charge with 12.5. The interest risk charge gets reported out of market risk summary (**FCT_MARKET_RISK_SUMMARY)** table under Interest Risk charge reporting line. Specific and general risk charge for interest rate is also reported separately from the summary table.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_STD_APPROACH

Sub-process:

- Market Risk Capital Risk Charge Calculation

- Market Risk IR Reporting Data Population

- Market RWA Calculation

Capital Charge for Equities

- The application calculates equity capital charge as the sum of specific risk charge and general risk charge. The process flow for calculation of equity risk charge is as follows:

Figure 64: Process Flow for Calculation of Equity Risk Charge
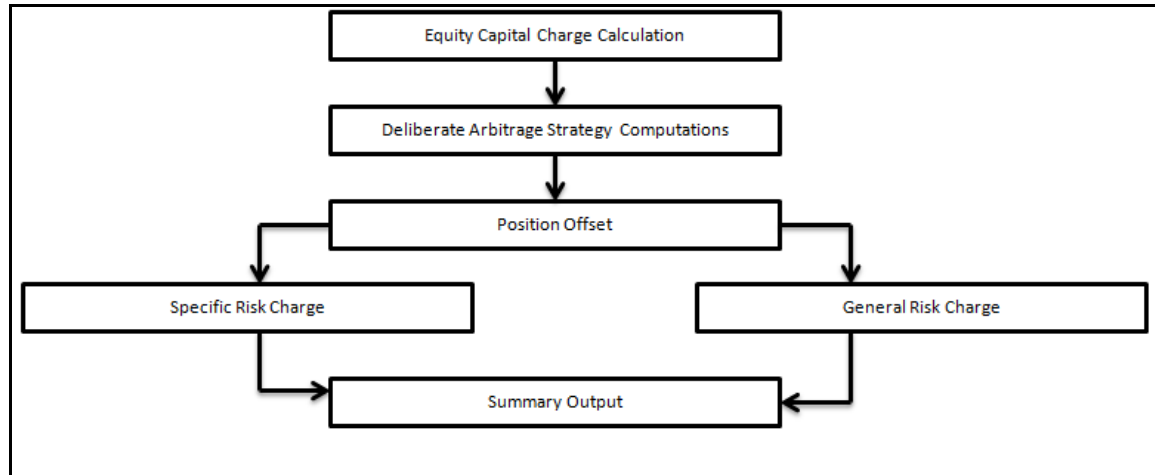
Deliberate Arbitrage Strategy Computations

The application identifies the deliberate and future arbitrage strategies for equity positions, in this process. Components, as per the Basel guidelines, for 10 percent slippage, exposure amount calculation under arbitrage, exclusions under deliberate arbitrage and so on, are computed under this process.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_STD_APPROACH

Sub-process: Market Risk Arbitrage Strategy

Position Offset

Long and short position in the same equity instrument are offset for the matched position and the net open position is carried forward as net long or net short position for specific and general risk charge calculation.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_STD_APPROACH

Sub-process: Market Risk Equity Offsetting

Specific Risk Charge

The application assigns specific risk charge as 8% on gross equity positions. For an index equity which is well diversified, a 4% specific risk charge is applied. In the case of equity derivative, the application takes into account either any future related arbitrage or deliberate arbitrage strategy created on equity. If equity arbitrage is created out of futures, then the application considers the arbitrage information as a mapping in the equity arbitrage mapping (EQ_ARBITRAGE_STRGY_MAPPING) table where any opposite future derivative created as hedge for the underlying equity exposures is expected. The application applies a 2% specific charge on lower of opposite index position created or equity underlying.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_STD_APPROACH

Sub-process:

- Market Risk Specific Risk Equity

- Market Risk Specific Risk Charge Calculation - IR and Equity

General Risk Charge

The application assigns 8% general risk charge for equity instrument type and then multiplies it with post offset exposure amount to arrive at the general risk charge. Delta-weighted positions of equity options are considered for general risk computations.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_STD_APPROACH

Sub-process:

- Mkt Risk General Risk Weight Assignment - FOREX and Equity

- Market Risk Generic Risk Charge Calculation - IR and Equity

8.7.9   Specific Market Risk Charge Calculation

Specific risk charge is calculated based on the categories and investment grade. The application first identifies the categories based on the conditions laid by the accord. After the category is identified the specific charge weight is assigned based on category, Basel equivalent rating, and residual maturity.

The specific risk weight is assigned under the Market Risk position conversion process. These specific risk weights are then multiplied by the exposure amount arrived at after position offset to eventually compute specific risk charge for Interest Rate instruments.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_STD_APPROACH

Sub-process: Market Risk Specific Risk Charge Calculation - IR and Equity

The application assigns specific risk charge as 8% on gross equity positions. For an index equity which is well diversified, a 4% specific risk charge is applied. In the case of equity derivative, the application takes into account either any future related arbitrage or deliberate arbitrage strategy created on equity. If equity arbitrage is created out of futures, then the application considers the arbitrage information as a mapping in the equity arbitrage mapping (EQ_ARBITRAGE_STRGY_MAPPING) table where any opposite future derivative created as hedge for the underlying equity exposures is expected. The application applies a 2% specific charge on lower of opposite index position created or equity underlying.

For more information on processes and sub processes that compute this, see the following:

Process: MKT_RISK_STD_APPROACH

Sub-process:

- Market Risk Specific Risk Equity

- Market Risk Specific Risk Charge Calculation - IR and Equity

8.8   Operational Risk Portfolio

Operational risk is a risk of loss resulting from inadequate or failed internal processes, people and systems, or external events". External Losses can occur due to Misappropriation of Assets, Tax Evasion, Theft of information, hacking damage or Third party theft or forgery. The Capital Adequacy guidelines prescribed by BIS has prescribed three methods for calculating Operational Risk capital charges and banks can use any of these methods to calculate capital charge:

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┌─────────────────────────────────────────────┐
│      Operational Risk Computation Apporach   │
└─────────────────────────────────────────────┘
        │              │               │
┌──────────────┐ ┌──────────────┐ ┌──────────────────────┐
│ Basic        │ │ Standardized │ │ Alternative          │
│ Indicator    │ │ Capital      │ │ Standardized Capital  │
│ Approach     │ │ Approach     │ │ Approach             │
└──────────────┘ └──────────────┘ └──────────────────────┘
```

When executing Solo Run for computing Operational Risk, the parent entity data is processed. However, for a Consolidated Run the parent entity and the subsidiary data are processed.

Process Flow for Operation Risk RWA

Figure 65: Process Flow for RWA

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┌─────────────────────────────────────────────────────────┐
│           Operational Risk Data Population               │
└─────────────────────────────────────────────────────────┘
                            ⇩
┌─────────────────────────────────────────────────────────┐
│      OR Internal LoB to Standard LoB Reclassification    │
└─────────────────────────────────────────────────────────┘
                            ⇩
┌─────────────────────────────────────────────────────────┐
│            OR Basel Methodology Assignment               │
└─────────────────────────────────────────────────────────┘
                            ⇩
┌─────────────────────────────────────────────────────────┐
│          OR Annual Gross Income Calculation              │
└─────────────────────────────────────────────────────────┘
                            ⇩
┌─────────────────────────────────────────────────────────┐
│               OR Beta Factor Calculation                 │
└─────────────────────────────────────────────────────────┘
                            ⇩
┌─────────────────────────────────────────────────────────┐
│    Operational Risk Entity Capital Charge Computation    │
└─────────────────────────────────────────────────────────┘
                            ⇩
┌─────────────────────────────────────────────────────────┐
│ Operational Risk Line of Business Capital Charge Computation │
└─────────────────────────────────────────────────────────┘
                            ⇩
┌─────────────────────────────────────────────────────────┐
│              Operational RWA Calculation                 │
└─────────────────────────────────────────────────────────┘
                            ⇩
┌─────────────────────────────────────────────────────────┐
│          Operation RISK SUMMARY POPULATION               │
└─────────────────────────────────────────────────────────┘
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8.8.1   Data Population

The data required for the Operational Risk RWA calculations are part of the Stage Operational Risk Data (STG_OPS_RISK_DATA). This is the entity level information for various operational attributes related to the entities and the Lines of business.

All the other data related to entities, as detailed in the Capital Structure and Common section will have to be provided, to help in the identification of whether the entities are part of consolidation or not.

This is handled in the rule OPS_RISK_DATA_POPULATION

8.8.2 Shareholding Percent Multiplication

For all the entities, which are part of regulatory consolidation and parent shareholding percentage is required is getting updates the shareholding percentage against each entity data. These details are captured in the Stage Entity Shareholding Details (STG_ENTITY_SHR_HLD_PERCENT) table. And using the shareholding percentage applicable for the entity, based on the solo or consolidation level, all the amount columns are multiplied by the corresponding shareholding percent.

This is handled in the Rules:

- OR Operating Income and Expense shareholding Percent Multiplication

- Shareholding Percent Multiplication of Balance sheet Attribute for Operational Risk

- OR Non Operating Income and Expense shareholding Percent Multiplication

- OR Other Income and Expense shareholding Percent Multiplication

- OR Other Income and Expense shareholding Percent Multiplication

8.8.3 Reclassification Rules

In the case of Operational Risk, the key reclassification rules are with respect to the entity type, which is based on the party type reclassification as detailed in the Credit risk section. The other relevant reclassification rules are the ones for the LOB Reclassification.

8.8.3.1 Line of Business Reclassification

- The internal lines of business, as maintained by the bank, are reclassified into Basel standard lines of business, as provided by the regulator for calculation of the operational risk..

- This is handled in the rule OR Internal LoB to Standard LoB Reclassification

8.8.4 Capital Charge Approaches

As part of the approaches suggested by the regulator for Operational Risk, the bank can follow one of the approaches, based on the supervisory approval, and bank meeting the operational requirements to comply with these guidelines.

- Basic Indicator Approach

- Standardized Approach

- Alternative Standardized Approach

8.8.4.1 Basic Indicator Approach

8.8.4.1.1 Capital Charge Calculation

Capital charge is calculated by multiplying the alpha value with the annual gross income of each year across each standard line of business. The average of 3 years is considered by the application, in sync with the regulatory ask.If the values of all the 3 years are not positive, then zero or the negative value from numerator and denominator is excluded.

In this approach, the alpha value is a fixed value set by the regulator.

This is handled in the rules Opr_Risk_Capital_Charge

8.8.4.1.2   Risk-Weight Asset Calculation

The capital charge value obtained is converted to the equivalent RWA value by multiplying with the factor of 12.5.

Operational Risk-Basic Indicator Approach - Data Population

Figure 66: Operational Risk-Basic Indicator Approach - Data Population
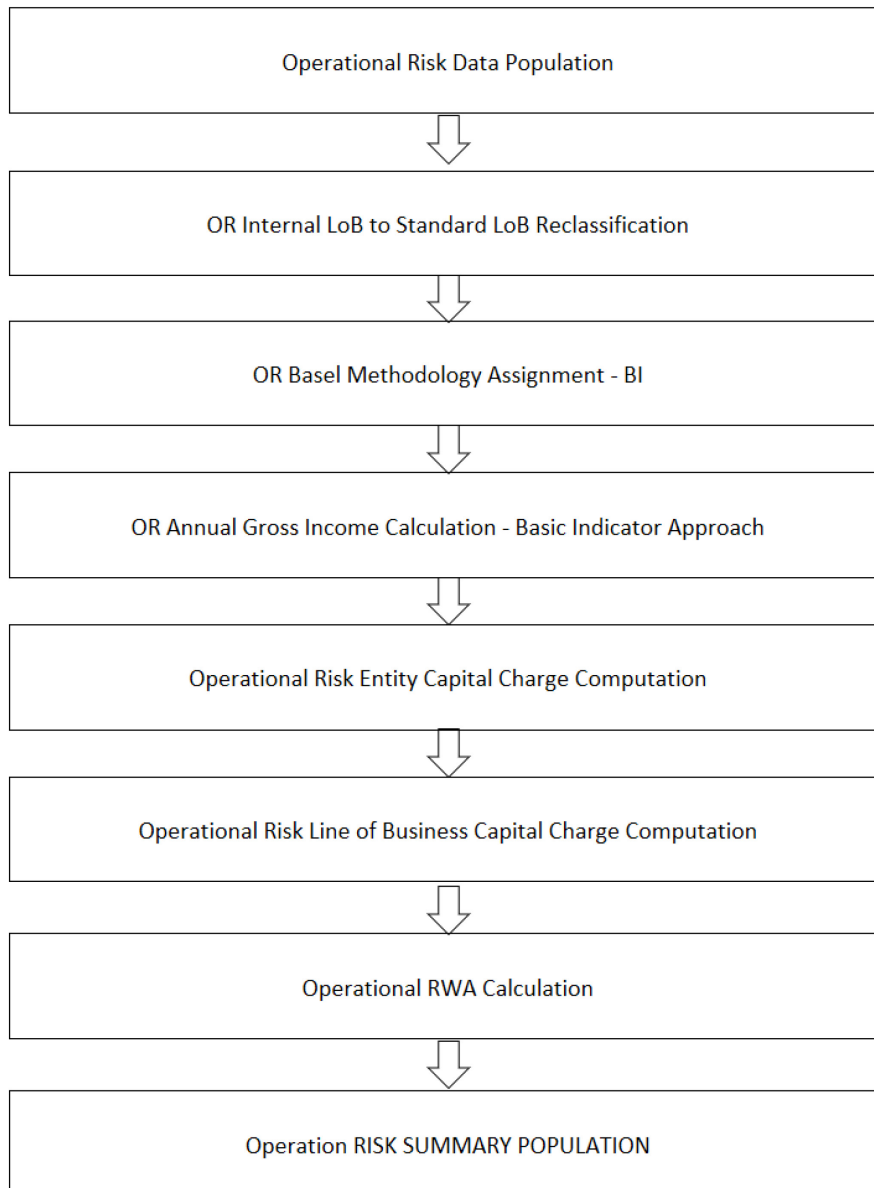
8.8.4.2   Standardized Approach

In this approach, the LOB reclassification is expected to reflect the relevant LOB provided by the regulator.

8.8.4.2.1 Capital Charge Calculation

Capital charge is calculated by multiplying the beta value with the annual gross income of each year across each standard line of business. The average of 3 years is considered by the application, in sync with the regulatory ask.If the values of all the 3 years are not positive, then zero or the negative value from numerator and denominator is excluded.

In this approach, the beta value is a fixed value set by the regulator, for each of the individual Lines of business.

This is handled in the in rule

Operational Risk Entity Capital Charge Computation

Operational Risk Line of Business Capital Charge Computation

8.8.4.2.2 Risk-Weight Asset Calculation

The capital charge value obtained is converted to the equivalent RWA value by multiplying with the factor of 12.5.

Operational Risk-Standardized Approach - Data Population

Figure 67: Process Flow for Operational Risk-Standardized Approach - Data Population

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┌─────────────────────────────────────────────────────┐
│            Operational Risk Data Population           │
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                          ⇩
┌─────────────────────────────────────────────────────┐
│       OR Internal LoB to Standard LoB Reclassification│
└─────────────────────────────────────────────────────┘
                          ⇩
┌─────────────────────────────────────────────────────┐
│         OR Basel Methodology Assignment - SA          │
└─────────────────────────────────────────────────────┘
                          ⇩
┌─────────────────────────────────────────────────────┐
│  OR Annual Gross Income Calculation - Standardized Approach │
└─────────────────────────────────────────────────────┘
                          ⇩
┌─────────────────────────────────────────────────────┐
│             OR Beta Factor Calculation                │
└─────────────────────────────────────────────────────┘
                          ⇩
┌─────────────────────────────────────────────────────┐
│   Operational Risk Entity Capital Charge Computation  │
└─────────────────────────────────────────────────────┘
                          ⇩
┌─────────────────────────────────────────────────────┐
│ Operational Risk Line of Business Capital Charge Computation │
└─────────────────────────────────────────────────────┘
                          ⇩
┌─────────────────────────────────────────────────────┐
│            Operational RWA Calculation                │
└─────────────────────────────────────────────────────┘
                          ⇩
┌─────────────────────────────────────────────────────┐
│          Operation RISK SUMMARY POPULATION            │
└─────────────────────────────────────────────────────┘
```
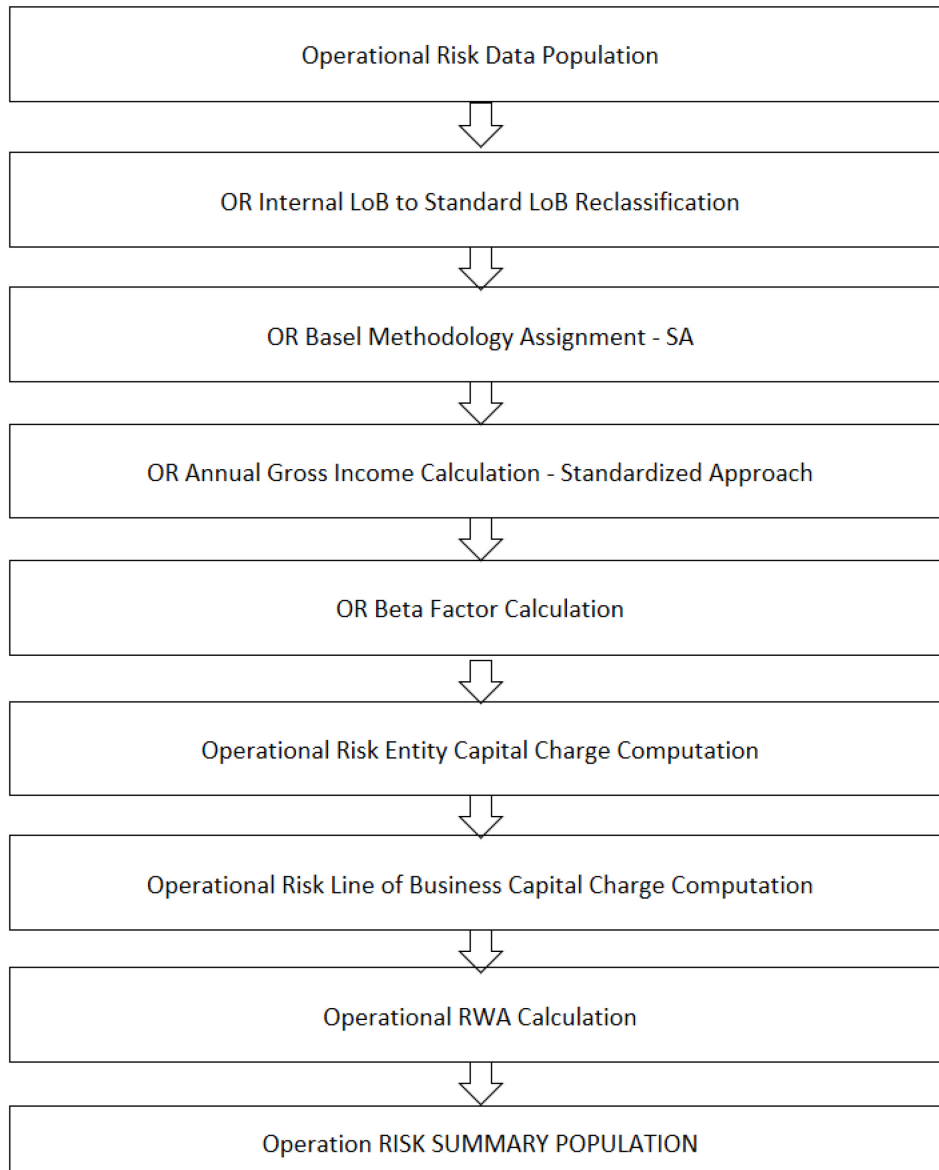
8.8.4.3 Alternative Standardized Approach

This approach is an extension of the standardized approach. In this approach for two lines of business: Retail Banking and Commercial Banking, the loan and advance amount is used (rather than annual gross income) which is multiplied by the fixed factor "m" and the beta factor.

8.8.4.3.1 Capital Charge Calculation

Capital charge is calculated by multiplying the beta value with the gross income specified for each of the LOB, for each year across each standard line of business. The average of 3 years is considered by the application, in sync with the regulatory ask. If the values of all the 3 years are not positive, then zero or the negative value from numerator and denominator is excluded.

In this approach, the beta value is a fixed value set by the regulator, for each of the individual Lines of business, and they are also being multiplied by the fixed factor of m.

This is handled in the rule OR_Capital_Std_App.

8.8.4.3.2   Risk-Weight Asset Calculation

The capital charge value obtained is converted to the equivalent RWA value by multiplying with the factor of 12.5.

Operational Risk – Alternative Standardized Approach - Data Population

Figure 68: Process Flow for Operational Risk – Alternative Standardized Approach - Data Population

8.8.5   Key Data Elements

Key data elements that noted while calculating the capital charge for OR for the consolidated entity.

To view the complete list of tables used for Operational Risk computation, see the Download Specification document.

Entity details, which are part of regulatory consolidation and parent entity shareholding percent is required. These details are captured in the Stage Entity Shareholding Details (STG_ENTITY_SHR_HLD_PERCENT) table.

Net Interest Income, Net Provision Amount, Net Non Interest Income, Operating Expenses, Security Sale Gain or Loss from HTM, Insurance Irregular Loss, Security Sale Gain or Loss from AFS, and Insurance Irregular Gain for each line of business and for each financial year is required.

8.9   Capital Structure

During the economic crisis, the global banking system had an insufficient level of high level quality capital. During the crisis, it was identified that there was inconsistency in the definition of capital across jurisdictions and lack of disclosure. To address this issue of inconsistency, the Basel committee has prescribed a new definition of capital to strengthen the global capital framework under Basel III.

Figure 69: Process Flow for Capital Structure

Sub process level:

```
                    ┌─────────────────────┐
                    (   Capital Structure  )
                    └─────────────────────┘
                               │
                               ▼
              ┌────────────────────────────────────┐
              │  Capital Structure Data Population  │
              └────────────────────────────────────┘
                               │
                               ▼
              ┌────────────────────────────────────┐
              │      Minority interest calculations │
              └────────────────────────────────────┘
                               │
                               ▼
          ┌──────────────────────────────────────────┐
          │ Capital to Standard Accounting head Population │
          └──────────────────────────────────────────┘
                               │
                               ▼
          ┌──────────────────────────────────────────┐
          │  Standard Account Cap Comp Group Assignment │
          └──────────────────────────────────────────┘
                               │
                               ▼
          ┌──────────────────────────────────────────┐
          │ Regulatory Adjustments Deduction Calculation │
          └──────────────────────────────────────────┘
                               │
                               ▼
                 ┌──────────────────────────┐
                 │   Provision Calculation   │
                 └──────────────────────────┘
                               │
                               ▼
                 ┌──────────────────────────┐
                 │  Gross capital calculation │
                 └──────────────────────────┘
                               │
                               ▼
                 ┌──────────────────────────┐
                 │ Phase in deduction calculations │
                 └──────────────────────────┘
                               │
                               ▼
        ┌──────────────────────────────────────────────┐
        │ Net cet1 post minority interest and regulatory adjustments │
        └──────────────────────────────────────────────┘
                               │
                               ▼
    ┌──────────────────────────────────────────────────────┐
    │ Insignificant investment in entities outside reg consolidation processing │
    └──────────────────────────────────────────────────────┘
                               │
                               ▼
    ┌──────────────────────────────────────────────────────┐
    │ Significant investment in entities outside reg consolidation calculation │
    └──────────────────────────────────────────────────────┘
                               │
                               ▼
             ┌────────────────────────────────────┐
             │   Threshold treatment calculations  │
             └────────────────────────────────────┘
                               │
                               ▼
             ┌────────────────────────────────────┐
             │  Post phase  in treatment calculations │
             └────────────────────────────────────┘
                               │
                               ▼
                 ┌──────────────────────────┐
                 │   Net capital calculations │
                 └──────────────────────────┘
                               │
                               ▼
                 ┌──────────────────────────┐
                 │ Capital reporting calculations │
                 └──────────────────────────┘
                               │
                               ▼
          ┌──────────────────────────────────────────┐
          │ Capital structure deductions rwa Calculation │
          └──────────────────────────────────────────┘
                               │
                               ▼
                 ┌──────────────────────────┐
                 │   Capital ratio calculations │
                 └──────────────────────────┘
```

As per the new definition in the Basel III accord, total capital consists of sum of the following elements:

- Tier1 Capital, which comprises of the following components,
    - Common Equity Tier 1

- Additional Tier 1

- Tier 2 Capital

    Each component of capital is subject to restrictions where CET1 must be at least 4.5% of total risk-weighted asset. Tier 1 capital must be at least 6.0% of total risk-weighted asset. Total capital must be 8.0% of total risk-weighted asset. Each component of capital undergoes minority interest and regulatory adjustments. The minority interest is applicable for a consolidated entity only, during the consolidation run. Most of the regulatory adjustment line items are to be deducted from CET1.

    All the regulatory adjustment line items follow a phase-in arrangement from the beginning of 2014 till 2017.

    In particular, the regulatory adjustments begin at 20% of the required adjustments to Common Equity Tier 1 on 1 January 2014, 40% on 1 January 2015, 60% on 1 January 2016, 80% on 1 January 2017, and reaches 100% on 1 January 2018.The same transition approach applies for all deductions from additional Tier 1 and Tier 2 capital.

    While executing Solo Run the parent entity data is processed. Investment into the subsidiary data is processed as per Credit Risk and Market Risk rule. Capital line item pertaining to parent entity is only processed.

    While executing Consolidation Run, the parent entity and the subsidiary data is considered.

8.9.1   8.9.1 Assumption

Investments in accounting entities (which are outside the scope of regulatory consolidation) by parent bank are long-term investments and mostly equity related instruments, hence these investments are not processed for Credit Risk Mitigation.

The GL codes are expected to be unique across entities in Stage General Ledger Data (STG_GL_DATA) and Capital Accounting Head Dimension (DIM_CAPITAL_ACCT_HEAD).

8.9.2   8.9.2 Data Population

Exposure level input for capital structure will flow from different stage portfolio tables.

Along with the portfolio level stage tables, application uses these below table,

Stage GL DATA (STG_GL_DATA),Stage Gl master(STG_GL_MASTER),Stage Party Share Holding Percentage (STG_PARTY_SHR_HLD_PERCENT),Stage Entity Share Holding Percentage (STG_ENTITY_SHR_HLD_PERCENT),Dim Organization Structure (DIM_ORG_STRUCTURE),Stage Standard Accounting Head (STG_STANDARD_ACCT_HEAD),Stage Legal Entity Details (STG_LEGAL_ENTITY_DETAILS), FSI_SETUP_CAPITAL_SOURCE (In this table application stores the CAPID details for example the capital component group or if it is eligible for transition),FSI_SETUP_CAPITAL_HEAD (In this table application stores all the seeded ratios as per regulatory guidelines).

8.9.3   8.9.3 Shareholding Percent Multiplication

Based on the share-holding percentage of the parent bank in the subsidiary and the consolidation approach to be followed for each of the entity, the Basel approach is selected.

For example: if the share-holding for an entity is 35% and is part of the consolidation process, then the approach selected for this entity is pro-rata consolidation. The reclassification is performed in task – 'Basel III Capital Consolidation Basel Approach Type Reclassification for an Entity' in the process '**CAPITAL_CONSOLIDATION AND PARAMETER ASSIGNMENT'**.

The entity level population is part of BIS Common Data Processing (PMFCOM020) process. The application updates the shareholding percentage against each entity common data in the fact capital accounting head from the fact entity shareholding percent table and update the capital accounting head amount multiplying with the shareholding percent of that particular entity. The parent data in the processing table of fact capital accounting head is updated with the value 1 and for each child entity, the data is based on the parent's holding percentage specified for each child in fact entity shareholding percent table.

8.9.4 8.9.4 Common Reclassification Rules

There is certain reclassification which are specific to the capital structure process – standard accounting head reclassification, and entity type reclassification.

Capital to Standard Accounting Head Reclassification

This is the reclassification of the Capital accounting head to standard accounting head. In this, all the Capital accounting heads of the bank need to be reclassified into the Standard Accounting Head, as that is the one which is being consumed in the application. This happens in the COMMON_RECLASSIFICATION (PMFCOM005) sub-process process in Common Data Processing (PMFCOM006).

Entity Type Reclassification

The entity type reclassification is also handled as part of the Party Type reclassification since there cannot be difference in the party type and entity type.

This happens in the BIS Other Reclassification (PMFCOM010) process.

Product to Capital Component Group Reclassification

This reclassification of the product to the capital component group is based on the Basel Product type, and this is handled at the individual portfolio tables of Investments and Derivatives. For investments this happens in the process INV_CAPITAL_STRUCTURE_RECLASSIFICATION_STD (PMFINV005) and for derivatives this happens in the DRV_RECLASSIFICATION_STD (PMFDRV012) in the process.

8.9.5 8.9.5 Gross Capital Calculations

For Gross Capital calculation all the components are classified into their respective tiers (CET1, AT1, and T2) based on the standard accounting head, and the specifications as mentioned by the regulator. The total gross capital for each tier of capital (CET1, AT1, and T2) is calculated as per the definition of CET1, AT1, and T2 by adding the relevant financial instrument in each tier of capital. This is processed using GROSS_CAPITAL_CALCULATIONS (PMFBISCS006) sub processes in **Capital Structure Data Processing (PMFBISCS021)** process.

8.9.6 8.9.6 Minority Interest Calculations

Surplus of Minority Interest

Minority Interests are calculated and the surplus amount in each tier of capital, which is attributed to third parties, are deducted from the gross capital of each tier of capital.

Minority interest is the amount that is attributable to any other party, which is not part of the bank's entities, and have shareholding in the entity. The surplus of minority interest is calculated as the third party's interest (shareholding percent) in the surplus capital (available capital – minimum required capital).

- All the values required for processing are populated into Minority Interest Capital (**FSI_MINORITY_INTEREST**) table which is the processing table for minority interest calculations.

- The sub process – MINORITY_INTEREST_CALCULATIONS (PMFBISCS001) in Capital Structure Data Processing (PMFBISCS021) process covers this processing.

- The minority interest is deducted from the gross capital of each tier of the capital.

8.9.7 8.9.7 Internal Transactions Deduction

The deduction also includes internal transactions in each tier of capital among the various entities which are part of the regulatory consolidation. This is to ensure that there is no double counting of exposures. This is handled in the process CAPITAL_STANDARD_ACCOUNTING_POPULATION (PMFBISCS002).

8.9.8 8.9.8 Regulatory Adjustments & Deductions from Each Tier of Capital

All the regulatory adjustment line items are expected as download in the Stage General Ledger Data table (STG_GL_DATA). Some of these line items are Good will, Other Intangibles, Deferred Tax Assets, Cash flow hedge reserve and so on. The related deferred tax liabilities are also expected to be provided as a download. The application calculates the values net of DTL and then processes it for the Regulatory Adjustments. The detailed list of these line items is part of the FSI Setup Capital Source (FSI_SETUP_CAPITAL_SOURCE) table.

The sub process – REGULATORY_ADJUSTMENTS_DEDUCTION_CALCULATION (PMFBISCS004) and PROVISION_CALCULATION (PMFBISCS005) in Capital Structure Data Processing (PMFBISCS021) process handle this requirement.

8.9.9 8.9.9 Certain Deductions part of Corresponding Deduction Approach

There are certain deductions which are expected to be part of each of the tier of capital. And they follow the corresponding deduction approach, wherein the deduction of the line item happens in the same tier of capital to which the exposure belongs to. This is being mostly pulled from the relevant

8.9.9.1 Investment in Own Shares

The investment in own shares are calculated as the sum of the pre-mitigation EAD (EAD Pre-mitigation Measure Value (**N_EAD_PRE_MITIGATION**). The source for investment in own share is the individual portfolio table.

The source for Non-Sec exposures is FSI Cap Investment Exposures (FSI_CAP_INVESTMENT_EXPOSURES), and FSI Cap Derivative Exposures (FSI_CAP_DERIVATIVES). The process where this is being handled is Capita Structure Data Processing (PMFBISCS021).

This populates into the Fact Calc accounting head (fct_calc_acct_head). This is being populated for each of the respective tier of capital.

The Investment in own shares is being calculated in the task INV_DRV_DEDUCTION_CALC_ACCT_HEAD_DATA_POP in Capital Structure Data Population (PMFBISCS019) process.

This also goes for phase in calculations, which is being handled in the PHASE_IN_DEDUCTION_CALCULATIONS (PMFBISCS007) process.

8.9.9.2 Reciprocal Cross-holdings

The Investment in reciprocal cross-holdings are calculated as the sum of the pre-mitigation EAD (EAD Pre-mitigation Measure Value) (**N_EAD_PRE_MITIGATION**) in FSI Cap Investment Exposures (**FSI_CAP_INVESTMENT_EXPOSURES**), and FSI Cap Derivative Exposures (**FSI_CAP_DERIVATIVE**) of the exposures which have the flag of reciprocal cross-holding indicator (**F_RECIPROCAL_CROSS_HLDG_IND**) as "Y".

For this processing, the reciprocal amount is expected as a download in the Stage Capital Investments Position Table (**STG_CAP_INVESTMENTS_POSITIONS**) at an instrument level. The instrument code provided in this table is the instrument in which the reporting bank has invested, and for which there is a reciprocal cross-holding by the reporting bank. The reciprocal cross-holding amount is also captured in this table. The application expects the staging data of the exposures to have the reciprocal cross-holding indicator (**F_RECIPROCAL_CROSS_HLDG_IND**) as 'Y'.

The application uses this INV_DRV_DEDUCTION_CALC_ACCT_HEAD_DATA_POP task in Capital Structure Data Population (**PMFBISCS019**) process to populate into the Fact Calc accounting head (**FCT_CALC_ACCT_HEAD**). This is being populated for each of the respective tier of capital.

This also goes for phase in calculations, which is being handled in the PHASE_IN_DEDUCTION_CALCULATIONS (**PMFBISCS007**) process.

And finally, the adjusted amount after deductions it goes back to the exposure level,

which is being handled in the CAPITAL_STRUCTURE_DEDUCTIONS_RWA_EXPOSURES (**PMFBISCS022**) from the process Capital Structure Data Processing (**PMFBISCS021**).

The exposure that meets the reciprocal cross-holding amount is stamped with the reciprocal cross-holding indicator (**F_RECIPROCAL_CROSS_HLDG_IND**) as 'Y'. This will be reduced in all the amount columns in FSI Cap Investment Exposures (**FSI_CAP_INVESTMENT_EXPOSURES**), and FSI Cap Derivative Exposures (**FSI_CAP_DERIVATIVES**) as per the reciprocal cross-holding ratio and store the actual amounts in FSI CAP DEDUCTION EXPOSURE table (**FSI_CAP_DEDUCTION_EXPOSURES**).

The portion of the exposure, which is above the reciprocal cross-holding amount is treated as a regular exposure and is risk-weighted as per the Basel asset class for that instrument.

8.9.9.3 Insignificant Investment

Investment in all financial entities, which are outside the scope of regulatory consolidation, is identified for significant and insignificant investments.

The shareholding percent for these parties are expected as download in Stage Party Shareholding Percent table (**STG_PARTY_SHR_HLD_PERCENT**). Any party which part of the Org Structure is, but is not part of the regulatory consolidation, can also qualify for this treatment, if it is financial entity. If the entity is part

of the Org structure, the shareholding percent is expected in the Stage Entity Shareholding percent table (**STG_ENTITY_SHR_HLD_PERCENT**).

The parties are identified as significant when the shareholding percentage is greater than or equal to 10%. And the others are identified as insignificant investment. This processing happens in the **PARTY_SHAREHOLDING_PERCENT** process.

The total investment amount in insignificant entities is computed by summing up the Pre-mitigation EAD (EAD Pre-mitigation Measure Value (N_EAD_PRE_MITIGATION)) from the portfolio tables FSI Cap Investment Exposures (FSI_CAP_INVESTMENT_EXPOSURES), and FSI Cap Derivative Exposures (FSI_CAP_DERIVATIVES). And also, the tier wise computation of investment amount happens. The total amount is compared with the 10% of the CET1 amount of the parent bank amount post regulatory adjustments. The amount above 10% limit is processed for deduction.

This summing up includes the direct, indirect and synthetic investments. The Indirect investments are investments in Investment funds, and which are invested in capital instruments. The synthetic investments are the investments in synthetic transactions on capital instruments. For all these exposures, the net long position amount, updated in **N_EAD_PRE_MITIGATION** is considered.

This is expected for all capital positions, and not for specific capital position.

The total deduction amount is pro-rated among each tier of capital based on the percentage of investment in each tier of capital. The amount arrived is deducted from each tier of Capital.

The investment amount below the 10% limit is treated as per banking book rule for the instrument.

The application computes as follows:

Parties are marked as insignificant investment parties by updating the flag: Significant Entity Indicator (**F_SIGNIFICANT_INVESTMENT_IND**) in Fact Party Shareholding Percent (**FCT_PARTY_SHR_HLD_PCT**) with value N, and **F_SIGNIFICANT_INVESTMENT_IND** in Fact Entity Info (**FCT_ENTITY_INFO**) with value N.

- The exposure amount of banking book and trading book exposures (any counterparty credit risk exposures) to these entities are summed by grouping their component of capital and compared against 10% of parent bank's CET1 capital. The portion of amount which exceeds the 10% limit is deducted.

- This is computed by calculating tier wise deduction percentage and multiplying this percentage with the exposure amount to arrive at the amount to be deducted from each tier of capital.

- The total investment values are populated into Non-Regulatory Consolidation Entity Investment (**FSI_NON_REG_CONSL_ENTITY_INVST**) table which is the processing table for insignificant and significant investment deductions.

- The sub process – INSIGNIFICANT_INVESTMENT_IN_ENTITIES_OUTSIDE_REG_CONSOLIDATION_PROCESSING (PMFBISCS010) in Capital Structure Data Processing (PMFBISCS021) covers the processing.

- After the application of this treatment, the Insignificant Investments line item also follow phase–in arrangement which is similar to the phase-in arrangement for Regulatory Adjustments.

8.9.9.4 Significant Investment

The total investment amount is checked against the set limit of 10% of CET1 amount of the parent bank, post insignificant investment amount adjustment. The CET1 amount above 10% is deducted from the CET1

post insignificant investment amount deduction. The CET1 amount below 10% follows threshold deduction. The investment amount in AT1 and T2 is fully deducted from its respective AT1 and T2 tier of capital. The application computes as follows:

Entities are marked as significant investment entities by updating the flag – Significant Entity Indicator (**F_SIGNIFICANT_INVESTMENT_IND**) in Fact Party Shareholding Percent (**FCT_PARTY_SHR_HLD_PCT**) with value Y and Significant Entity Indicator (**F_SIGNIFICANT_INVESTMENT_IND**) in Fact Entity Information (**FCT_ENTITY_INFO**) with value 'Y'.

The exposure amount of banking book and trading book exposures (any counterparty credit risk exposures) to these entities are summed by grouping their component of capital and compared against 10% of parent bank's CET1 capital. The portion of amount which exceeds the 10% limit is deducted from CET1. The exposures of AT1 and T2 are fully deducted from respective tier of capital. This is done by calculating deduction percentage for CET1 and by multiplying this percentage with the CET1 exposure's exposure amount to arrive at the amount to be deducted from CET1 capital.

The sub process – SIGNIFICANT_INVESTMENT_IN_ENTITIES_OUTSIDE_REG_CONSOLIDATION_PROCESSING (PMFBISCS011) in Capital Structure Data Processing (PMFBISCS021) covers the processing.

After the application of this treatment, the Significant Investments line item also follow phase–in arrangement which is similar to the phase-in arrangement for Regulatory Adjustments.

8.9.10   Threshold Deduction Treatment

Threshold Deduction is populated in the **FSI_THRESHOLD_TREATMENT** table and the threshold calculations are processed in this table

The line items, (Significant and insignificant Investment in the Common Shares of Accounting entities are populated from the FSI NON REGULATORY CONSOL ENTITY INVESTMENT table (FSI_NON_REG_CONSL_ENTITY_INVST), Mortgage Servicing Rights net of Deferred Tax Liabilities are populated from the Fact Standard Accounting head (FCT_STANDARD_ACCT_HEAD) table, and DTAs that arises from temporary differences are populated from the Fact Capital Accounting Head (FCT_CAPITAL_ACCT_HEAD).

The three-line items' significant investment in the common shares of BFSI where the bank owns more than 10%, Mortgage Servicing Rights (MSR), and DTAs that arises from temporary differences is processed for threshold deduction are populated in the Capital Threshold Treatment (**FSI_THRESHOLD_TREATMENT**) table and the threshold calculations are processed in this table. These three-line items are individually compared with the 10% of CET1 calculated Post Regulatory Adjustments, Insignificant Investments, and Significant Investment. The amounts which are above 10% CET1 limit are deducted from CET1 following the phase-in arrangements. During the transition period, any amount of these three-line items, which is not deducted as per the 10% mentioned earlier, is summed up for the aggregate 15% limit check. During the transition period, the check of 15% is against the CET1 post all regulatory adjustments and adjustments to insignificant investments and significant investments and the individual threshold deduction. In the post transition period, instead of 15%, the aggregate check is 17.65% of CET1, post all regulatory adjustments and adjustments to insignificant investments, less 100% of the sum of the line items which goes for threshold deduction.

The amount which is not deducted due to this 10% and 15% check is risk-weighted 250% during the transition period and is risk-weighted 250% post the transition period. The entire processing is done in the sub process – 'THRESHOLD_TREATMENT_CALCULATIONS (PMFBISCS012) in Capital Structure Data Processing (PMFBISCS021).

8.9.11   Net Capital Calculations

The net CET1, net AT1, and net T2 capital amount are calculated post all regulatory adjustments. Any shortfall in T2 capital amount is adjusted against Net AT1 amount and any shortfall of AT1 capital amount is adjusted against Net CET1 amount.

This is done in sub process – NET_CAPITAL_CALCULATIONS (PMFBISCS014) in Capital Structure Data Processing (PMFBISCS023)

For RWA, RWA_POPULATIONS (PMFBISCS016) in Capital Structure Data Processing (PMFBISCS023).

For net capital it is NET_CAPITAL_CALCULATIONS (PMFBISCS014) in Capital Structure Data Processing (PMFBISCS023).

8.9.11.1   Total RWA Calculations

The RWA amount for Credit Risk - Non-Securitization, Counterparty Credit Risk, Credit Valuation Adjustment Risk Weighted Asset, Credit Risk - Securitization, Market Risk, and Operational Risk and Regulatory Capital Phase in Related RWA are calculated by summing up the RWA amount.

The Phase-In RWA captures the capital instrument investments that goes for deduction from Capital but because of Phase-In arrangement are to be risk-weighted such as – Reciprocal Cross-holding, Treasury Stock, Insignificant Investment amount, Significant Investment amount and Threshold deduction amount.

 These are reported under different Capital accounting heads such as 'Risk-weighted Asset amount for Standardized Portfolios/IRB portfolio' for Non-Securitization, "Sec Std RWA" for Securitization portfolio, "Market RWA" for Market Risk and "Operational RWA" for Operational Risk.

This is part of the RWA_POPULATIONS (PMFBISCS016) in Capital Structure Data Processing (PMFBISCS023).

8.9.11.2   Capital Ratio Calculations

Tier 1 capital ratio and capital adequacy ratio are calculated using the total RWA amount, net Tier 1 capital, and Total capital amount.

For capital ratio, the process is CAPITAL_RATIO_CALCULATIONS (PMFBISCS017) in Capital Structure Data Processing (PMFBISCS023).

8.9.11.3   Required Capital ratio

This process is handled in CAPITAL_RATIO_CALCULATIONS (PMFBISCS017).

In this the application calculates CET1 capital ratio, T1 capital ratio, T2 capital ratio and a total capital ratio summing all of them.

And the same is being compared with the required capital ratio provided as an input for the specific regulator. The required capital ratio is being provided as an input in the FSI Setup Capital Accounting Head (FSI_SETUP_CAPITAL_HEAD).

8.9.11.4   Deficit or Excess Capital

The shortfall is handled in the sub process Net capital calculations (PMFBISCS014),

Here the application calculates CET1 , AT1 and T2 capital shortfall amounts.

8.9.11.5   Key Data Elements

Key data elements to process the Capital Structure for the consolidated entity is as follows. For a complete list of tables and columns to be updated, see the Download Specifications document.

Entity details which are part of regulatory consolidation and parent entity shareholding percent. This data is captured in Stage Entity Shareholding Details (STG_ENTITY_SHR_HLD_PERCENT) table.

The capital structure component for each tier of capital for all entities involved in regulatory consolidation.

The total RWA, total CET1, AT1, and T2 amount and third-party percentage of holdings in each tier of capital for minority interest calculation.

The regulatory adjustment amount like goodwill, DTA, other intangible assets, cash flow hedge reserve, and defined pension fund asset, MSR, and so on.

The transaction of the investment amount for accounting entity which is outside the scope of regulatory consolidation.

The CET1, AT1, and T2 capital of the entity which has third party minority holdings in it are expected as a download in legal entity details (STG_LEGAL_ENTITY_DETAILS) table. Similarly, the third-party investment in each tier of capital is also expected as a download in legal entity details table.

The minimum required capital for each tier for each capital adequacy regulator (for the entity that has third party minority holding in it) is expected in the setup table - Setup Capital Heads (FSI_SETUP_CAPITAL_HEAD).

The Total RWA (CAP838) for the entity that has third party minority holding in it is a download value in Stage Standard Accounting Head (STG_STANDARD_ACCT_HEAD).

8.9.11.6   Limitations

The limitations in the release of OFSCAP 8.1.0.0 is as follows:

- **Investment in Own Shares Treatment**

    The investment in own shares which goes for capital treatment, has a phase-in treatment, wherein during phase-in a portion of the exposure goes for deduction from capital, and the remaining portion of the exposure goes for 100% RW. This is handled in the processing by the Phase-In treatment table, and this RW gets added into the Regulatory RWA Accounting Head.

    But for reporting, the reporting happens from an account level granularity, and not at a higher granularity of the accounting head. As the current application does not split the exposures into two in the processing portfolio tables, the account level and the Phase-In treatment table values do not reconcile with each other. Currently, this must be specifically addressed in the reporting layer and is not part of the OOB product.

8.10   Capital Buffers

Capital Buffer is calculated after the calculation of Capital Ratios, as they go as an input to Buffer calculation. Each sub-process is explained in detail under Capital Buffer section of the user guide.

For example, Required Capital Conservation Buffer and Required Countercyclical Buffer calculation are detailed in the 'Required Total Buffer' sub-section of the Capital Buffer section in this document. Similarly, Minimum Capital Conservation ratio is detailed in the 'Capital Conservation Ratio' sub section of Capital Buffer section in this document.

Figure 70: Process Flow for Capital Buffers
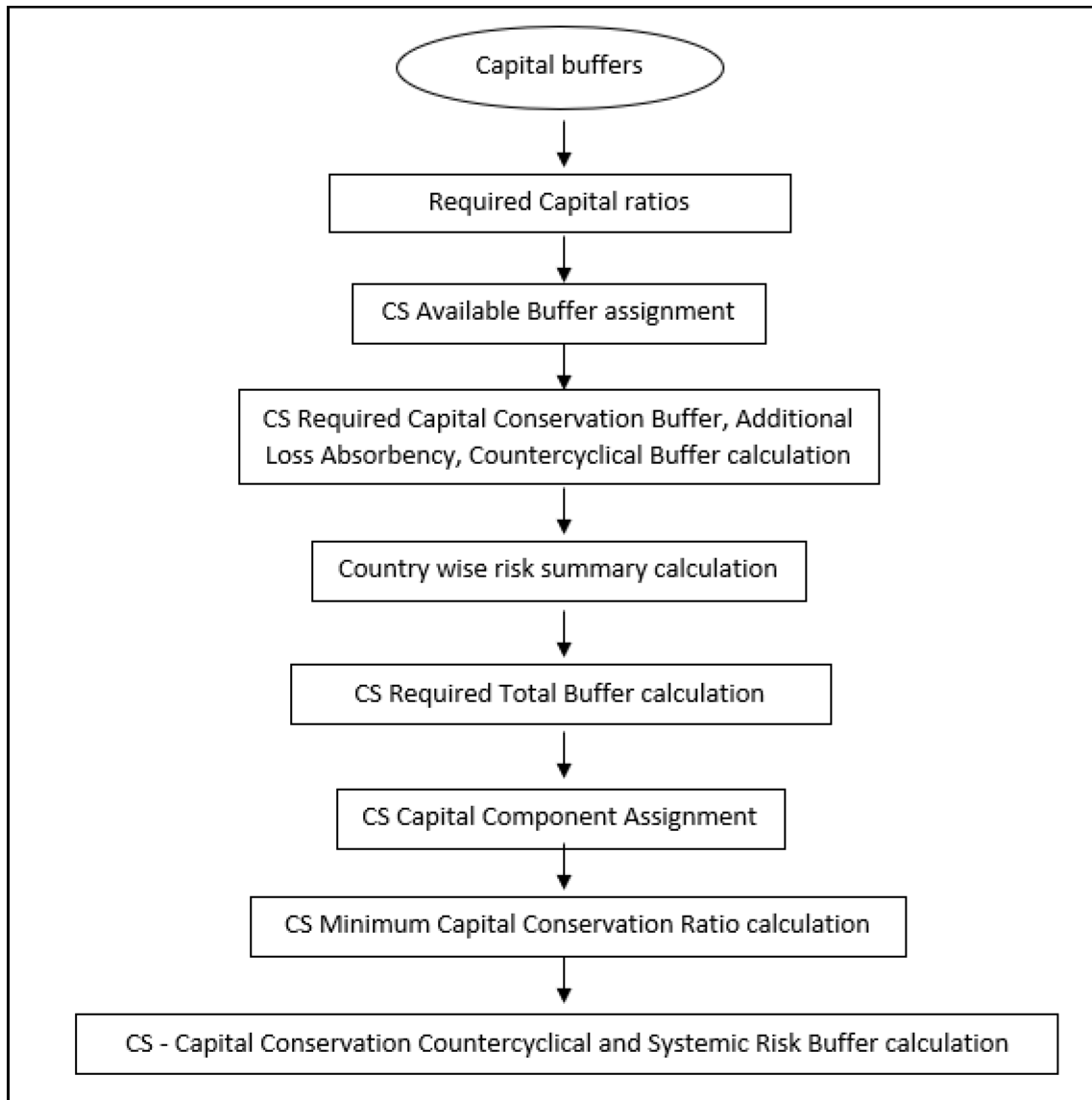
8.10.1   Data Population

The major input for capital buffers is the total capital ratio and the Net Common Equity Tier 1 Capital Ratio s which gets computed as part of the capital structure process. This is consumed from the fact standard accounting head.

Along with that, the application consumes additional data related to buffers from the Stage Countrywide Risk Summary (STG_COUNTRYWISE_RISK_SUMMARY) which is used to populate country wise risk summary.

FSI Benchmark Capital Conservation Ratio (FSI_BENCHMARK_CAP_CONS_RATIO) and FSI Benchmark Countercyclical Buffer (FSI_BENCHMARK_CNTR_CYC_BUFFER).

8.10.2   Buffer Requirements

There are different types of Capital which the banks are expected to maintain:

- Capital Conservation Buffer

- Countercyclical Buffer

- Additional Loss Absorbency Capital (for G-SIB)

A detailed description of each of these buffers is provided in the following sections.

8.10.2.1   Capital Conservation buffer

As part of the Basel III compliance, requires banks are required to maintain Capital Conservation Buffer (CCB) out of Common Equity Tier 1 Capital (CET1).

This buffer is used to ensure that any loss should not erode the bank's capital, and hence it is expected to be met over and above the Required CET1 Capital. The actual required ratio for the jurisdiction is being specified in the FSI Setup Capital Head (FSI_SETUP_CAPITAL_HEAD).

8.10.2.2   Countercyclical Buffer

As part of the Basel III compliance, banks are required to maintain Countercyclical Buffer that is prescribed by the respective jurisdiction's regulator through an extension of Capital Conservation buffer.

The application calculates the buffer requirement for internationally active banks as the weighted average of the buffers required across all the jurisdictions to which the bank has exposures, weighted on basis of the exposure amount to different countries of the counterparty of their exposures.

If the guarantor and credit default swap is present for an exposure, then the application considers the domicile country of these mitigants for the covered portion and country of the exposure counterparty for uncovered portion. After calculating the weighted average, the application then computes a single value for Countercyclical Buffer benchmark which is applicable on all exposures of all jurisdictions.

8.10.2.3   Additional Loss Absorbency Buffer (GSIB Buffer)

If a banking organization is categorized a Globally–Systematically Important Banks (G-SIB), then the application identifies all subsidiaries in various jurisdictions as G-SIB as well. Based on this assessment, banks are assigned a GSIB score and the applicable bucket is decided. Identification of this bucket is based on the score as per the guidelines. Loss absorbency is required to be met as an extension of Capital Conservation and Countercyclical for computational buffer for computational purposes.

8.10.3   Required Buffers

Required Total Buffer (CAP825) is the sum of the three required buffers: (CAP829) Required Buffer from CET1 Capital, (CAP830) Required Buffer from Tier 1 Capital, (CAP831) Required Buffer from Capital Adequacy Ratio.

The calculated values (only positive values are considered) are stored against the corresponding Cap IDs as two separate line items of which one is 0.

The Required buffers as a percentage are provided as a download in the FSI Setup Capital Account Head (FSI_SETUP_CAPITAL_ACCCT_HEAD), as per the specific regulatory need. This is being multiplied by the Total RWA to arrive at the Required Buffer as an amount.

8.10.4 Assumptions

Countercyclical Buffer requirement for each country must be provided by the client or the bank as the final percentage applicable for each country and this is dependent on the home regulator. G-SIB status and applicable bucket information for each entity must also be provided by the client/bank.

For Required Weighted Average Countercyclical Buffer calculation, the exposures used in the bank are all accounts exposed to credit risk (Securitized and Non-Securitized) and those exposed to Market Risk. However, the application can be restructured to consider only those exposed to Credit Risk.

In Capital Conservation Ratio, for the computation of the quartiles that are used to arrive at Minimum Capital Conservation Ratio, the application is dependent on the required CCB ratio. From 2013 till 2016, CCB requirements keep changing every year as per the transitional arrangement, For the purpose of calculating the quartiles range, the application considers it as per the transitional arrangement. At the same time, the application has the flexibility to have the required CCB constant at 2.5% throughout. Also, the minimum required CET1 Ratio considered for the purpose of building these quartiles is 4.5%

8.10.5 Key Data Elements

Key data elements are elaborated in this section. For a complete list of tables to be updated, see the Download Specifications document.

Countercyclical Buffer requirement for each country must be provided by the client or the bank as the percentage applicable for each country is dependent on the home regulator's jurisdiction. The home regulator's jurisdiction can prescribe Countercyclical Buffer percentage that is higher than the percentage prescribed by the regulator of exposure country. Hence, the required Countercyclical Buffer percentage for each exposure country provided as input must be the one that the home regulator agrees to.

G-SIB status and applicable bucket information for each entity must be provided by the client or the bank. In case of a consolidated Run, loss absorbency charges applicable to the parent, as required by the regulator of parent, is applicable to the complete Run. This Run output is supposed to be reported to the jurisdictional regulator of the parent. For a Solo Run, loss absorbency charges as required by regulator for a subsidiary entity are applicable. Hence, for Solo and Consolidated Runs, G-SIB status of the reporting bank, and the applicable bucket, is provided by the bank itself.

As the required Capital Conservation Buffer (CCB) must be met as per the transitional arrangement, therefore the required buffer value must be setup in Setup Capital Heads (**FSI_SETUP_CAPITAL_HEAD**) table for different periods against the standard account head ID CAP823. Different CCB requirements specified by the different regulators can be setup by specifying the regulator codes against the same standard account head ID. This regulator code must be the same as the jurisdiction code assigned by the Rule Jurisdiction Code Assignment.

The required benchmark of Countercyclical Buffer for different countries as set by different regulators is expected as download in Stage Benchmark Counter Cyclical Buffer (**STG_BENCHMARK_CNTR_CYC_BUFFER**). This data is populated to Benchmark Counter Cyclical Buffer Ratio (**FSI_BENCHMARK_CNTR_CYC_BUFFER**) using a Slowly Changing Dimension (SCD) process. Buffer requirement given on a date is valid till the next buffer is specified. For a solo Run, the regulator of subsidiary specified buffer requirements are considered and for consolidation Run, the consolidating entity's regulator specified buffer requirements are considered.

The Additional Loss Absorbency requirement specified by different regulators for different buckets must be setup in the table Benchmark Loss Absorbency Ratio (**FSI_SETUP_BENCHMARK_LOSS_ABS**). For the

solo Run, loss absorbency requirement set by the local regulator is considered. For consolidation Run, the consolidating entity's regulator specified loss absorbency requirement is considered.

There is an option to directly input the applicable loss absorbency percentage. This is also useful when the percentage applied is different from the corresponding bucket percentage. This must be provided in the column **N_LOSS_ABS_OVERRIDE** of the table Stage Legal Entity Details (**STG_LEGAL_ENTITY_DETAILS**). If this column has a value, it is given priority over loss absorbency percentage corresponding to the bucket.

The minimum Capital Conservation Ratios requirement for different quartiles (1, 0.8, 0.6, 0.4, 0) is expected as a download in Stage Benchmark Capital Conservation Ratio (**STG_BENCHMARK_CAP_CONS_RATIO**). This data is populated to the semi-static table Benchmark Capital Conservation Ratio (**FSI_BENCHMARK_CAP_CONS_RATIO**) using a SCD process. Conservation ratios specified once are valid till the next revision.

In the **FSI_REQUIRED_CNTR_CYC_BUFFER** table the post-mitigation exposure amount is updated against each country code. This is applicable for Credit Risk (for Non-Securitization and Securitization exposures) and Market Risk.

8.11 Large Exposures

The large exposure framework is a framework detailing on how the banks have to manage its exposures to various parties both at individual level, as well as to the group of connected clients' level.

The large exposure framework has to be complied with the bank at both solo and consolidated level. As part of the solo execution, the bank has to identify its large exposures, and comply within the required threshold limit.

As part of the consolidation execution, the bank has to identify the total large exposures at the consolidated level, and comply within the required threshold limit.

The solo and consolidation are as per the regulatory definitions and same as the one which is being used for the regular capital adequacy.

The large exposures are identified based on the comparison of the total individual party's exposures to the Tier 1 Capital, which changes based on whether it is a solo execution or consolidation execution.

8.11.1 Data Population

The large exposure computations require data pertaining to the various portfolio – banking, investment, derivatives, securities and financing transactions, and trading book exposures.

Non Securitization Data Population

Data must be loaded in the application for all the product types and is same as Capital Adequacy related data expectation.

See the individual portfolio for the data elements:

- Banking
- Investment
- Derivatives
- Securities Financing transactions

Mitigant Data Population

The data related to the mitigants associated to the exposures are captured in this process. This is also the same as the regular capital adequacy run related data.

For more information about Mitigant Data Population, see Mitigant Processing section.

Securitization Data Population

Data must be loaded in the application for all the relevant Securitization tables and is same as Capital Adequacy related data expectation.

For more information about securitization data population, see Securitization Data Population section

Trading book Data Population

Data must be loaded in the application for all the trading book exposures and is same as Capital Adequacy related data expectation.

For more details, please refer Market Risk Data Population.

All these data are populated into the processing table of **FSI_LARGE_EXPOSURE_ACCT_DETAIL**.

Large exposure data population is handled in the sub-process **LARGE_EXPOSURE_DATA_POPULATION**

8.11.2   Reclassification

 The reclassification rules are same as the ones already detailed in the individual portfolio – banking, investment, derivatives, securities and financing transactions, securitization, and trading book exposures.

In addition to the above, the reclassification which is specific to large exposures are the one mentioned below.

8.11.2.1   Party Relationship reclassification

All the relationships at party level are expected in the stage party –party relationship table (**STG_PARTY_PARTY_RELATIONSHIP**)

The Large Exposures computation require the details of the party's relationship to one another, since there are different limitation to the group exposure (which will be a group of connected counterparties based on various relationship types), and to individual counterparties (without considering any other related counterparties).

From a definition perspective, connected counterparties are individual entities that are considered as a group due to the direct or indirect control established between entities. This direct or indirect control is being identified based on the party-party relationship table, wherein each and every related party's information are provided, and the relationship type is also defined.

This is reclassified into the standard relationship type, to be used for further processing and reporting.

8.11.3   Computation of the Direct Exposures

The direct exposures are the actual exposures that are in the bank's portfolio in the form of banking, derivatives and SFT exposures. In the case of investment portfolio, the direct exposures are the ones which are investment in the form of debt securities or equity, and which do not have any underlying dependencies. This is handled for individual counterparties.

This gets handled as part of the sub process **BIS_LARGE_EXPOSURE_EAD_ASSIGNMENT** under the process **LARGE_EXPOSURE_DATA_PROCESSING**.

8.11.4 Computation of Indirect Exposures

The indirect exposures are the mitigants that have been provided to the exposures in the bank's portfolio in the form of banking, derivatives, investment and SFT exposures. This is handled for individual counterparties.

This gets handled as part of the sub process **BIS_LARGE_EXPOSURE_EAD_ASSIGNMENT** under the process **LARGE_EXPOSURE_DATA_PROCESSING**.

8.11.5 Computation of Synthetic Exposures

The synthetic exposures are the ones pertaining to Securitization and CIU, wherein there are synthetic exposures to the underlying of these transactions.

In this scenario, these exposures are computed by assigning them to the unknown clients or the actual counterparty to whom the underlying belongs to, depending on data availability.

This is handled for individual counterparties.

The computation of gross credit exposure for CIU/SPV is handled in the process **LARGE_EXP_SPV_UNDERLYING_PROCESSING**

8.11.6 Exempted Exposures

There are certain exposures which are being exempted from the large exposure calculations. These are mostly as specified by the regulator, and include the cleared transactions, and other exposures that are deducted from capital, since it does not make sense to consider them in the large exposure calculations.

This is handled for individual counterparties.

The computations with respect to this are handled in the subprocess **BIS_LARGE_EXPOSURE_EXEMPTIONS** of the process **LARGE_EXPOSURE_DATA_PROCESSING.**

8.11.7 Calculation of Total Exposure to a counterparty

Calculation of gross credit exposure depends on the specific product category of on-balance sheet, off-balance sheet exposure, derivative products, secured lending and borrowings, exposures arising from CIU, exposures arising from SPVs along with the exposures to third parties of the SPVs and trade exposures. Calculation also covers indirect exposures of the counterparty arising out of the mitigant exposures of the bank.

This is applicable for all the counterparties for which the bank has exposures in the form of either direct, indirect or synthetic exposures.This is handled in the sub-process **LARGE_EXPOSURE_COUNTERPARTY_POPULATION** and **BIS_LARGE_EXPOSURE_COUNTERPARTY_PROCESSING** in the process **LARGE_EXPOSURE_DATA_PROCESSING**.

8.11.8   Identification of Related Parties

It is expected that the party ID is the one for which it is considered as a related party. For example, if Bank A is related to party B, and party B is related to party C, it is expected that the data is provided for Bank A to party B, and Bank A to party C, to ensure that every mapping is being considered.

The solution sums up the exposures for all the counterparties belonging to the same parent, along with the parent, and populates the FSI Large Exposure Account Detail Table (**FSI_LARGE_EXPOSURE_ACCT_DETAIL**).

The expectation is that all the parties which are related to each other, have the Parent ID of the Party table as the same, or are part of the related party. Based on these related parties identified, and the parent id in the DIM_PARTY, the related parties are identified, and these are also considered as belonging to the same group.

This is handled in the sub-processes **LARGE_EXP_PARTY_GROUP_MEMBER_MAPPING** and **LARGE_EXP_PARTY_GROUP_EXP_POPULATION** in the process **LARGE_EXPOSURE_DATA_PROCESSING.**

On the party group, the threshold limit check is applied, and the large exposures are identified.

8.11.9   Calculation of Total Exposure to a group of related counterparties

All the total exposures of the parties will be clubbed together to calculate the total party group exposures. This will be based on the related parties identified. This is the total exposure on the basis of which the large exposure identification happens, and also the breach condition check happens.

This is handled in the sub-process **BIS_PARTY_GROUP_LARGE_EXP_PROCESSING** in the process **LARGE_EXPOSURE_DATA_PROCESSING.**

8.11.10   Total Capital of the Bank

This is used to calculate the total capital of the bank. This is computed as per the Capital Structure related calculations.

This is handled in the sub-process **LARGE_EXPOSURE_CAPITAL AMOUNTS_POPULATION** in the process **LARGE_EXPOSURE_DATA_PROCESSING**.

8.11.11   Identification of Large Exposure Counterparties

The large exposures are identified based on whether the group exposure of the counterparties exceed the required threshold using the pre mitigation value.

This is handled in the sub-process **BIS_PARTY_GROUP_LARGE_EXP_PROCESSING** in the process **LARGE_EXPOSURE_DATA_PROCESSING.**

8.11.12   Threshold criteria for Large Exposure Counterparties

The regulator indicates the threshold criterion below which the large exposures can be maintained by the bank. This threshold percent is assigned based on the standard party type of the counterparty, as specified by the regulator.

This is handled in the sub-process **Large Exposures Counterparty Threshold Amount Calculation** in the process **BIS_LARGE_EXPOSURE_COUNTERPARTY_PROCESSING.**

8.11.13 Large Exposure Breach Calculations

The application identifies whether there has been any breach to the large exposure threshold as specified by the regulator and are stamped a flag indicating that the counterparty as a group have breached it.

This is handled in the sub-process **Large Exposures Counterparty Threshold Limit Breach Indicator Assignment** in the process **BIS_LARGE_EXPOSURE_COUNTERPARTY_PROCESSING.**

8.12 Leverage Ratio

During the financial crisis, banking institutions built-up excessive on-balance sheet and off-balance sheet leverage which forced the banking sector to reduce its leverage. To prevent building of excessive leverage on the institutions' balance sheet, the BIS has introduced a non-risk based leverage ratio which is a new regulatory tool supplementing risk-based capital requirement. The leverage ratio guidelines were revised and published on 10th October 2014. The guidelines are mostly in sync with the revised leverage ratio guidelines issued in 2014 by BIS.

The solution supports this revised approach in the calculation. The application calculates the leverage ratio for a reporting bank. The minimum required leverage ratio is 3%.

The leverage ratio is calculated by dividing an institution's Tier 1 capital measure by the total leverage exposure measure.

$$\textbf{Leverage Ratio} = \frac{\textbf{Tier 1 Capital}}{\textbf{Leverage Exposure Measure}}$$

The Run Basel III Revised Leverage Ratio Calculation is used for computing the leverage ratio, as per the revised guidelines.

Net Tier 1 capital is the summation of Net CET1 and Net AT1 capital amount post regulatory adjustment. Exposure measure is the summation of on-balance sheet items, off-balance sheet items, Derivative Exposures and Structured Financial Transactions (SFT). The on-balance sheet items include the Non-Securitization exposures' amount and the Securitization exposures' amount. The off-balance sheet items include the Non-Securitization exposures' amount and the Securitization exposures' amount. Mitigation is not considered when calculating exposure amount.

The leverage calculation happens at the consolidated parent entity level. The market risk data are not captured for the EU Jurisdiction, and hence that is expected as a download. This is expected in Stage Standard Account Head (**STG_STANDARD_ACCT_HEAD**) for the CAP843 (Leverage Ratio).

The leverage ratio calculations are a separate run, and not part of the regular capital calculation run. This is because of the changes in the Credit conversion factor assigned to the exposures, and also exemption of few exposures from the calculation which are part of the capital charge calculations. Also, the mitigation is not required for these exposures, and the exposure measure calculations are different from the regular EAD calculations.

The accord is not explicit on the inclusion of Securitization and market related transactions in the exposure measure calculations. However, the application has considered Securitization and the market related transactions in the calculation of total leverage exposure measure.

As the application does not support market related capital calculations pertaining to the BIS jurisdiction, the application expects the MR related Exposure measure as a download.

Figure 71: Process Flow for Leverage Ratio
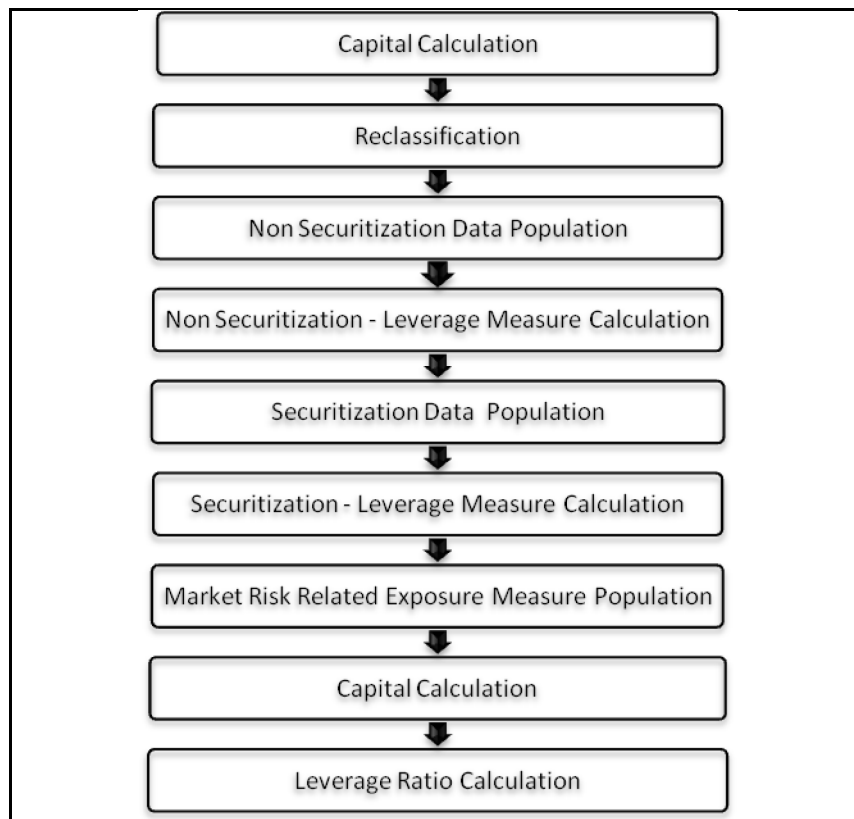
8.12.1 Data Population

Non Securitization Exposure Data Population

Data from the Product Processors are populated to FCT_NON_SEC_EXPOSURES table in the process NON_SEC_DATA_POPULATION. This data population also remains the same as existing in the capital calculation run.

Collateral of Derivative

Collateral for the derivatives, which is already considered in the MTM calculation, are provided in the STG_MITIGANTS table with the eligibility flag as 'N' and the corresponding entry is added into the STG_EXP_MITIGANT_MAPPINGS table.

The MTM provided for the derivatives' instruments, must be after following the corresponding operational accounting framework.

Securitization Data Population

Securitization exposure data is populated to securitization processing table in the process SEC_DATA_POPULATION. The population remains the same as in the capital calculation run.

Key Data Elements

Key data elements are elaborated in this section. For a complete list of tables and columns to be populated, see the Download Specifications document.

To calculate the leverage ratio, exposure amount for all product types and the total capital are required.

The key data elements for exposure measure calculation of the various product types are as follows:

- On-Balance Sheet Exposures: For on-balance sheet items, End of Period (EOP) balance amount, write-off, and accrued interest amount is required.

- SFT Exposures: For repo products, exposure amount, and instrument rating are required.

- Derivative Exposures: For derivative products, exposure mark to market value, notional principal amount, and underlying instrument types are required.

- Off-Balance Sheet Exposures: For off-balance sheet items, undrawn amount is required.

- Securitization Transaction: For securitization transactions, exposure amount is required.

- Capital Calculation: See the Capital Structure for more details.

- Cash Variation Margin: The collateral segregated flag, exchange traded flag, and netting agreement code are required.

- Netting Agreement: The margin threshold and the minimum transfer amount are required, which are captured in the Stage Net Exposures table (STG_NET_EXPOSURES).

8.12.2   Exposure Measure Calculations

- After data is populated in Non-Sec processing table, the exposure measure is calculated in the process **BASELIII_LEV_RATIO_EXPOSURE_MEASURE_CALCULATION**.

- The Exposure measure is the sum of the Pre-mitigation EAD amount of the following exposure types:

- On-Balance Sheet Exposures

- Off-Balance Sheet Exposures

- SFT Exposures

- Derivative Exposures

- Details on the calculation of these exposure measures are mentioned in the following sections. All the exposure measures are computed and populated into the Leverage Exposure amount (**N_LEVERAGE_EXPOSURE_AMOUNT**) column. And any exempted exposures are identified by the solution in the Regulatory Capital Exemption Criteria in the Non-Sec Exposures processing table. These exempted criteria are part of the dimension table of Regulatory Capital Exemption Criteria Dimension (**DIM_REG_CAP_EXEMPTION_CRITERIA**).

8.12.2.1   On Balance Sheet Exposures

- The accounting value of the on-balance sheet exposures net of specific provisions and valuation adjustments are considered for the exposure measure. The valuation adjustments are captured at an instrument level, in the FSI setup table for Instrument Valuation Details (FSI_SETUP_INSTR_VALUATION_DTLS).

- The exposure measure considered is the Pre-Mitigation amount, and does not consider the benefit of the mitigation.

- Some of the exempted exposures are detailed as follows.

- **Fiduciary Assets**

- If the bank considers the assets of the fiduciary assets, as the bank's own assets, then, these assets are exempted from the calculation. The fiduciary assets are identified based on the exposures having the Parent Fiduciary Account Number (V_PARENT_FIDUCIARY_ACCT_NUMBER) in the product processor (PP) staging tables.

- The bank has to select the run management option to select whether the exposures are derecognized in the balance sheet or not. If the run management option of Y is selected, all the fiduciary assets with the parent fiduciary account is exempted from the Leverage Exposure Measure calculations. If the run management option of N is selected, specific fiduciary assets can be exempted from the Leverage Exposure Measure calculations. These specific fiduciary assets are expected to be provided in the FSI Fiduciary Assets setup table (FSI_SETUP_DEREC_FIDUCIARY_ASST).

- This is handled in the Fiduciary Assets Exemption sub-process of the BASELIII_LEV_RATIO_EXPOSURE_MEASURE_CALCULATION process.

8.12.2.2   Off Balance sheet exposures

The exposure amount for off-balance sheet exposures is the undrawn amount of the exposure multiplied by the CCF. The CCF of the exposures remain the same as in the Capital Calculation Run, except that the CCF is floored at 10%. The flooring of the CCF to 10% is handled by the rule Non-Sec Off Balance Sheet Exposures CCF Percent Flooring in the Non-Sec CCF Assignment sub process. This exposure measure does not consider the mitigation effect.

8.12.2.3   Derivative Exposures

Derivative transactions (OTC Derivatives) exposure measure are calculated using the Mark to Market Method. The add-on assignment is same as what is mentioned in the Capital Calculation Run. The exposure measure is the sum of market value, and the notional amount multiplied by the add-on percent.

The derivative exposure measure has few specific treatment, in terms of the Leverage Exposure Measure calculations. They are as detailed as follows.

Collateral of Derivative

The collateral received with reference to the derivatives, cannot be used in netting, and reducing the exposure amount of the derivatives. Based on whether the operative accounting framework allows for netting of the collateral or not, the solution updates the exposure measure. The solution expects a run management selection to identify whether the bank considers netting of the collateral outside the application, and provides the netted amount as input to the product processor staging tables.

The collateral of derivative is given in the mitigant table. There is a run management option to capture whether the operative accounting framework allows for netting of the collateral as per the master netting agreement or not.

If 'Yes' is selected, assuming that the bank has provided the MTM value based on already considering the collateral amount, the collateral amount is added to the MTM of the exposure. And if 'No' is selected, there is no change to the MTM value.

8.12.2.4 SFT Exposures

The exposure amount of the SFT Exposures to be considered for the leverage measure is post the effect of the collateral. The SFT Exposures data provided in the staging must not consider the accounting netting.

The data capture for the SFT exposures remain the same as in the Capital calculation run. The bank role in the SFT transaction is also captured in the staging table.

The Gross amount and the Add-on amount, as expected in the accord are computed by the application. The Gross amount is the actual transaction amount of the SFT exposures, as provided in the Repo contracts staging table. And the Add-on amount is the difference between the fair value of the repo exposures and the fair value of the collateral placed or received.

- The fair value of the exposures, including the placed collateral are captured at an instrument level, in the FSI setup table for Exposure Fair Value Details (**FSI_SETUP_INSTR_VALUATION_DTLS**), and the fair value of the mitigants are captured in the FSI setup table for Mitigant Fair Value (**FSI_SETUP_MTGNT_VALUATION_DTLS**).

The mitigants which are used to offset the fair value of the repo exposures, are stamped accounting heads, to ensure that they can be tracked.

The exposure amount calculations are different for the bank acting as a principal in the SFT transactions, and an agent in the SFT transactions. The solution supports both the treatments.

For bank acting as an agent, the solution handles all the treatment mentioned in the accord. The data expectation for them are as follows:

- Case 1: Bank is an agent, and does not get involved in any other role with the SFT Exposure

  In this case, the data is not expected in the Repo contracts staging table.

- Case 2: Bank is an agent, and provides a guarantee equal to the difference between the SFT Exposure and the collateral amount

  In this case, the data is expected in the Repo contracts staging table, with the bank role as an agent, and the indemnity indicator (**F_INDEMNITY_IND**) as 'Y'.

  The application computes only the Add-on amount for this SFT transaction, inline with the guidelines. And this Add-on amount is populated into the Add-on column of the processing table. This Add-on amount is caluclated in the data transformation Lev_Ratio_SFT_Addon_amt.

  This is handled in the sub process (Leverage Ratio Computations) of the process (**BASELIII_LEV_RATIO_EXPOSURE_MEASURE_CALCULATION**).

- Case 3: Bank is an agent, and provides a guarantee more than the difference between the SFT Exposure and the collateral amount

  In this case, the data is expected in the Repo contracts staging table, with the bank role as an agent, and the indemnity indicator (F_INDEMNITY_IND) as Y. And a separate guarantee transaction is expected to be recorded in the guarantee staging table. This guarantee transaction is also provided as a mitigant with the mitigant table also storing the guarantee contract ID (**V_GUARANTEE_CONTRACT_ID**). And the exposure and the mitigant must be mapped to each other in the exposure mitigant mapping table **STG_ACCOUNT_MITIGANT_MAP**).

  This guarantee is not for a mitigant treatment, and hence, this is expected with the mitigant eligibility flag as 'N'. This identified guarantee is populated in FNSE.n_repo_contract_skey.

The application computes both the gross exposure amount and the addon amount for this SFT transaction, inline with the guidelines. This Add-on amount is caluclated in the data transformation Lev_Ratio_SFT_Addon_amt.

This is handled in the sub process (Leverage Ratio Computations) of the process (**BASELIII_LEV_RATIO_EXPOSURE_MEASURE_CALCULATION**).

8.12.2.5 Total Capital Calculations

Capital measure is calculated in EU_CAPITAL_STRUCTURE process. Capital Measure used in the leverage ratio is equal to Net Tier 1 which is post all regulatory adjustments. The capital structure is the same as the capital calculation run.

8.12.2.6 Leverage Ratio Calculations

The leverage ratio is calculated as follows.

Leverage Ratio = Tier 1 Capital / Total Leverage Exposure Measure

This is computed in the process – BASELIII_LEV_RATIO_LEVERAGE_RATIO_CALCULATION.

9   BIS Basel III IRB Approach

Capital Adequacy guidelines as issued in the following regulations are incorporated in OFS Financial Services Basel Regulatory Capital:

BIS Jurisdiction: International Convergence of Capital Measurement and Capital Standards, June 2006.

Basel III: A global regulatory framework for more resilient banks and banking systems, Dec 2010 (rev June 2011).

This approach covers the following topics:

- Credit RWA

- Counterparty Credit RWA

- Default Fund Contributions Related Capital Charge

- Credit Valuation Adjustments

- Credit RWA for Securitization

- Market Risk RWA

- Operational Risk RWA

- Capital Structure

- Capital Buffers

- Large Exposures

- Leverage Ratio

9.1   Credit RWA

The application supports the computation of Credit RWA, as per the guidelines laid out in the Basel Accord. Credit RWA computation is divided into Credit Risk for Non Securitized exposures process and Credit Risk for Securitized exposures process.

For Credit Risk of Non Securitized and Securitized exposures, the Foundation IRB Approach (FIRB) and Advanced IRB Approach (AIRB) is as follows.

Figure 72: Process Flow for Credit RWA
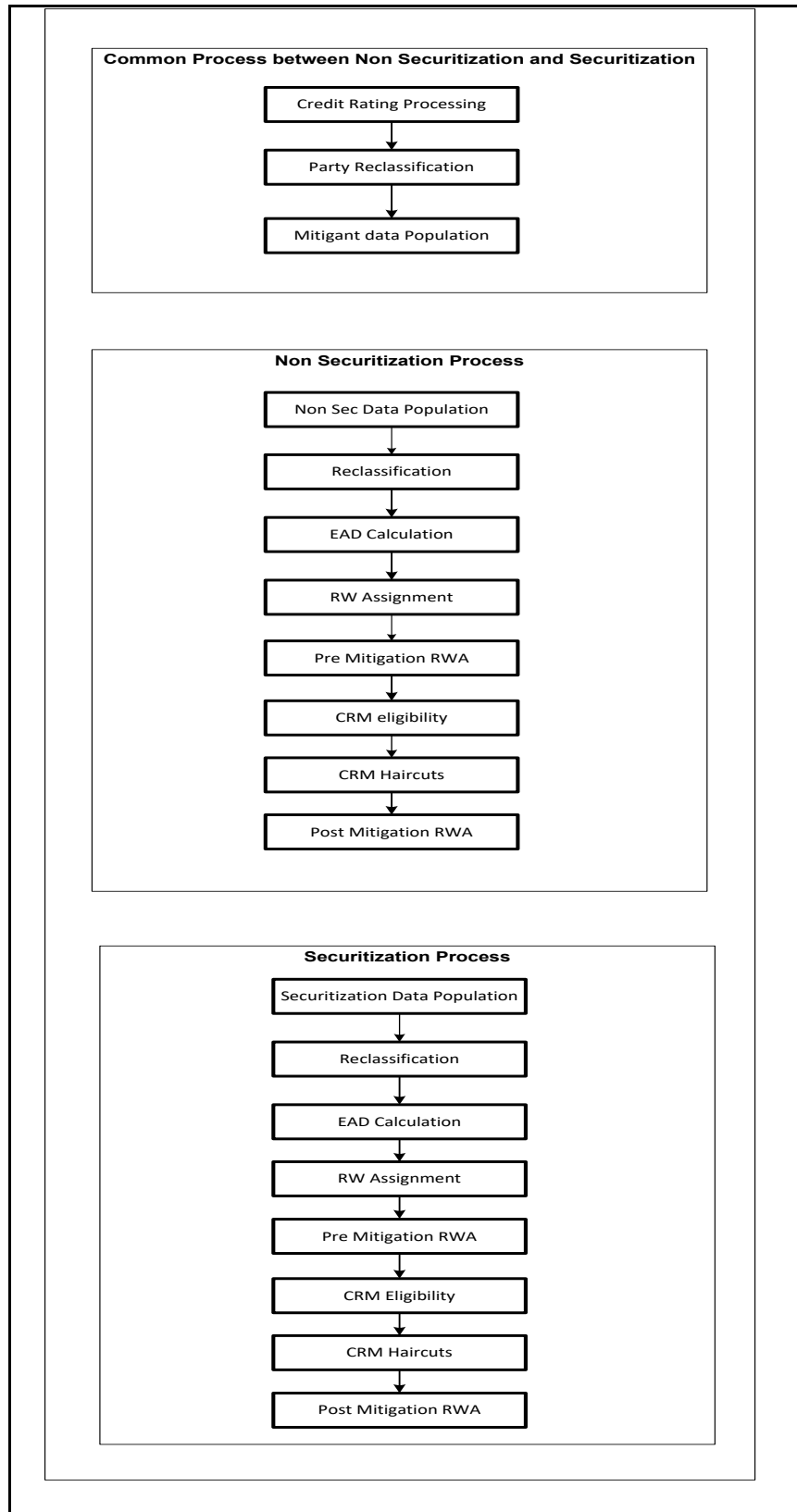
A Credit RWA Run is a combination of the Non Securitization RWA process and Securitization RWA process. A few processes like Credit Rating, Party Type Reclassification, and Mitigant Data Population are

common between Non Securitization and Securitization process. Though these sub processes are explained separately under Non Securitization and Securitization section of this document, it is executed only once under the Credit RWA run

Certain sub processes under Non Securitization process like Reclassification, RW assignment, and so on are common across all types of exposures for example: banking book, over the counter derivative transactions, and securities financing transactions, and are executed only once in the Run. The details of these sub processes are explained under Reclassification and Risk Weight Assignment sub process of the Basel II Non Securitization exposures section of this document. Likewise, details of Credit Risk Mitigation for Non Securitization process is detailed under the Basel II Non Securitization section of this document and details of Credit Risk Mitigation for Securitization process is detailed under the Basel II Securitization section of this document.

For more information on the sub processes as detailed in the preceding process flow for the Non Securitization process and Securitization process, see **Error! Reference source not found.**.

For example: Non-Sec Data Population is detailed under data population and currency conversion of Credit RWA (Non Securitization - Standardized approach) section of this document.

9.1.1 Banking Portfolio

9.1.1.1 Rating Population

The rating population in the case of IRB Approach is not relevant, and is only used for the mitigants, as they are used for the mitigant eligibility rules.

In addition, it is also applicable for the specialized lending exposures wherein data is expected in the Stage Account Rating Details (STG_ACCOUNT_RATING_DETAILS), for processing related to it.

9.1.1.2 Data Population

The data population remains the same as in Standardized Approach

9.1.1.3 Shareholding Percent Multiplication

The shareholding percent multiplication for the various amounts associated with the exposure remains the same as in Standardized Approach.

9.1.1.4 Common Reclassification Rules

The reclassification rules are consistently the same across all the approaches of the calculations. This is same as in Standardized Approach.

9.1.1.5 Asset Reclassification Rules

The asset reclassification is based on the various combinations of the Basel product type and the standard counterparty type and any other filters as relevant. This remains functionally the same as in Standardized Approach.

For AIRB, Process Name: **BNK_RECLASSIFICATION_AIRB**

For FIRB Process Name: **BNK_RECLASSIFICATION_FIRB**

The sub-processes in both is as follows:

BIS - Banking Basel Asset Reclassification based on Party Type – IRB

BIS - Banking Basel Asset Reclassification based on Product Type - IRB

9.1.1.6   Pre-mitigation Calculations

Some exposures can be hedged against credit risk through various mitigants like guarantors, collaterals, credit derivatives, and so on. These provide mitigation to credit risk and must be considered while computing Credit RWA as per Basel norms. Hence, the application calculates pre-mitigation risk-weighted assets amount and post-mitigation risk-weighted assets amount.

The application calculates the correlation factor using the formula specified for each asset class. Using Correlation factor, PD, and LGD, the application calculates the pre-mitigation capital charge for each exposure. This value signifies the capital charge the bank has to maintain for each exposure, prior to considering any mitigation effects.

The application calculates pre-mitigation exposure at default amount and risk weight for each exposure. Further, it computes pre-mitigation risk-weighted assets (Pre-CRM RWA) by multiplying the EAD by risk weight. The risk weight is arrived at by multiplying pre-mitigation capital charge with 12.5.

9.1.1.6.1   Credit Conversion Factor (CCF Assignment)

This is an input required for converting the off balance sheet component of the exposure (undrawn portion associated with an on balance sheet or off balance sheet product, or the exposure amount of an off balance sheet product). This is based on the supervisory provided values, and is determined based on the product type and the maturity associated with the exposure in the case of FIRB Approach. In the case of AIRB Approach, the CCF can be either based on the supervisory estimate or own estimate.

This will populate the Drawn CCF (for the CCF to be assigned to the exposure amount of the off balance sheet product) and the Undrawn CCF (for the CCF to be assigned to the undrawn portion of the on balance sheet and off balance sheet exposures).

This happens in the sub-process **CCF_ASSIGNMENT_IRB** in **Banking Data Processing – FIRB** and **Banking Data Processing –AIRB processes**.

9.1.1.6.2   Exposure at Default Amount Calculation

Exposure at Default (EAD) is calculated for all the products. This is being computed using the Exposure Amount (EOP Balance of the Exposure), Undrawn Amount of the Exposure (Undrawn Amount) and also the Credit Conversion Factor for the Off Balance sheet Amount (CCF). This is computed for the on balance sheet products separately, and the off balance sheet products separately.

In the case of FIRB as well as AIRB Approach, it can either be the formulae specified above, or bank can model and directly provide the EAD as a download.

This happens in the sub-process **BNK_PRE_CRM_EAD_COMPUTATION_IRB** in **Banking Data Processing – FIRB** and **Banking Data Processing –AIRB** processes

9.1.1.6.3   Post CRM EAD

Through the CRM process, the bank takes into account the effect of the mitigation and calculates the post-mitigation exposure at the default amount. This signifies the maximum loss that the bank can suffer in case of default on this exposure, after considering the effects of the mitigation. This will be the EAD of the Exposure Pre Mitigation less the covered portion of the mitigant.

9.1.1.6.4   Capital Charge Rules

In the case of IRB Approach, the Capital charge is being computed for both unexpected loss as well as Expected loss.

Unexpected Loss Calculations

Unexpected Loss is calculated as using the Probability of Default (PD), Loss Given Default (LGD), Effective Maturity (M) and Correlation Factor.

This is handled in the sub-process **Banking Pre-Mitigation Capital Required for UL**

For FIRB - in the process **CAPITAL_CALCULATION_FIRB**

For AIRB - in the process **CAPITAL_CALCULATION_AIRB.**

PD Calculations

Probability of Default (PD) signifies the likelihood of a borrower failing to meet his/her financial obligations. In both FIRB and AIRB, PD values are expected as input/download from the bank. This gets captured as part of the data population process.

There are certain flooring requirements and capping requirements that are specified for each of the asset class.

This is handled in the sub process as below:

- o   For FIRB - In the sub-process PD_LGD_ASSIGNMENT_FIRB in the process Banking Data Processing – FIRB.

- o   For AIRB - In the sub-process PD_LGD_ASSIGNMENT_AIRB in the process Banking Data Processing – AIRB.

LGD Calculations

Loss Given Default (LGD) signifies the portion of the exposure that is likely to be lost in case the borrower defaults. In FIRB, LGD is computed by the application, as per the regulatory ask for each of the asset class. In addition, in the case of AIRB, LGD is also expected as a download.

All PD and LGD calculations are handled in the process as below:

For FIRB - In the sub-process **PD_LGD_ASSIGNMENT_FIRB** in the process **Banking Data Processing – FIRB**.

For AIRB - In the sub-process **PD_LGD_ASSIGNMENT_AIRB** in the process **Banking Data Processing – AIRB**.

Effective Maturity Calculations

Effective maturity (M) will be 2.5 years for exposures to which the bank applies the foundation approach, except for repo-style transactions where the effective maturity is 6 months (i.e. M=0.5). In addition, in the case of AIRB, this is also expected to be provided by the bank using the modeling requirement.

The effective maturity (M) is subject to a floor of one year and a cap of 5 years

All maturity calculation are handled in the process as below:

For FIRB - In the sub-process **MATURITY_CALCULATION_AND_ASSIGNMENT_FIRB** in the process **Banking Data Processing – FIRB.**

For AIRB - In the sub-process **MATURITY_CALCULATION_AND_ASSIGNMENT_AIRB** in the process **Banking Data Processing – AIRB.**

Correlation Calculations

The correlation is being computed as per the requirement provided by the regulator by using all the inputs of PD, LGD, EAD and Effective Maturity.

As per the regulatory ask, the application assigns the multiplier of 1.25 to the Asset Value Correlation (AVC) of exposures wherever relevant. These exposures relate to regulated financial firms with assets of at least 100 billion USD and to exposures of unregulated financial firms (regardless of size). This gets consumed in the correlation formulae applicable for the asset classes' specific calculation, as specified by the regulator.

This is calculated in the sub-process **Basel III Banking Correlation Factor**

o   For FIRB - in the process **CAPITAL_CALCULATION_FIRB**

o   For AIRB - in the process **CAPITAL_CALCULATION_AIRB**

Capital Charge Calculations

The capital charge for the unexpected loss is computed using the regulatory provided calculation specific for the asset classes. This gets handled in the process as below:

o   For FIRB - in the process **CAPITAL_CALCULATION_FIRB**

o   For AIRB - in the process **CAPITAL_CALCULATION_AIRB**

Purchased Receivables – Default Risk Charge Calculations

In the case of Purchased receivables, the capital charge is computed for both the dilution risk as well as the default risk.

Under Internal Ratings Based approach, banks have the option of selecting Top Down approach or Bottom Up approach for calculating default risk capital charge for Purchase Receivables

In Top Down approach, the risk weight calculation happens at a pool of receivables as a whole level instead of at individual obligor level. On the other hand, Bottom Down approach uses individual receivables making up the pool to arrive at the capital charge. Banks have the option to decide which approach to use. (For more information, see Run Management)

This is handled in the sub-process **Banking Capital Required for UL - Defaulted Exposures IRB**

For FIRB - in the process **CAPITAL_CALCULATION_FIRB**

For AIRB - in the process **CAPITAL_CALCULATION_AIRB.**

Purchased Receivables – Dilution Risk Charge Calculations

In the case of Purchased receivables, the capital charge is computed for both the dilution risk as well as the default risk.

Purchase receivables always have an inherent risk of diluting future cash flows because of cash and non cash credits such as discounts and guarantees. This risk needs to be quantified in case the bank feels Dilution Risk is material. Banks can decide whether Dilution Risk capital charge is required or not. (For more information, see Run Management)

This is handled in the sub-process **Banking Pre-Mitigation Capital Required for Dilution Risk**

For FIRB - in the process **CAPITAL_CALCULATION_FIRB**

For AIRB - in the process **CAPITAL_CALCULATION_AIRB.**

Expected Loss calculation

Expected loss is the loss which the bank expects it will incur during the course of holding the exposure. This is mostly computed by using the attributes of PD, LGD and EAD.

This is calculated as the product of PD, LGD and EAD. This Is applicable for most of the asset classes.

This is handled in the sub-process **Banking Pre-Mitigation – EL**

For FIRB **-** In the process **PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_FIRB**

For AIRB **-** In the process **PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_AIRB**

9.1.1.6.5 RWA Calculations

IRB approaches calculate RWA for dilution risk (**Banking RWA For Dilution Risk**), pre mitigation RWA unexpected loss (**Banking Pre-Mitigation RWA – UL**) as well as pre mitigation RWA expected loss (**Banking Pre-Mitigation RWA – EL**).

All these sub-processes can be found in the below process:

- For FIRB - In the process PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_FIRB

- For AIRB - In the process PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_AIRB

9.1.1.7   Credit Risk Mitigation Process

Credit Risk Mitigation is the same as in the Standardized approach of the calculations.

9.1.1.7.1   Mitigant Eligibility

The mitigant eligibility remains the same as in Standardized Approach, except for the scenario wherein the bank can only follow Comprehensive Approach for collateral recognition, and not simple Approach.

9.1.1.7.2   Mitigant Approaches and their Risk Weighting Rules

The mitigant approaches applicable for IRB are only the Comprehensive Approach for Collateral recognition. This is same as in Standardized Approach.

And in the case of unfunded mitigant in the form of guarantee and credit derivatives, the risk weights are calculated by using the PD of the mitigant provider, and the LGD of the covered exposure, and using the risk weight function as applicable for the mitigant asset class.

This is handled in the sub-process **CAP Collateral Eligibility for IRB Mitigants** in the process **Mitigant Collateral Eligibility – Comprehensive Approach – BIS.**

9.1.1.7.3   Mitigant Haircut Assignment

Under IRB approach, the bank can follow either supervisory estimates (in the case of FIRB/ AIRB) or bank's own estimate (in the case of AIRB) for Mitigant Haircut assignment. This is based on the various categories like mitigant type, residual maturity, rating, issuer type etc.

All the other part of the haircut assignment is same as in Standardized Approach.

9.1.2 Investment Portfolio

9.1.2.1 Data Population

Data Population is explained in detail under the Investment Portfolio sub section of the Credit RWA section in this document

In addition to the Product Processor tables, FSI Setup Account Modeling Information (FSI_SETUP_ACCT_MODELING_INFO) is used for providing the input required for the Capital charge calculation, and which is based on the bank's specific models. Some of the attributes picked up from this table are PD, LGD in the case of AIRB approach, Effective Maturity, CCF Own Estimate (in the case of AIRB approach) etc.

This is handled in the process **Investment Data Population.**

9.1.2.2 Shareholding Percent Multiplication

Shareholding Percent Multiplication is explained in detail under the Investment Portfolio sub section of the Credit RWA section in this document.

9.1.2.3 Common Reclassification Rules

Common Reclassification Rules is explained in detail under the Investment Portfolio sub section of the Credit RWA section in this document.

9.1.2.4 Asset Reclassification Rules (different from STD)

The asset reclassification is based on the various combinations of the Basel product type and the standard counterparty type and any other filters as relevant. This remains functionally the same as in Standardized Approach.

For both FIRB and AIRB, Process Name: **INV_DATA_RECLASSIFICATION_IRB**

For FIRB Process Name: **BNK_RECLASSIFICATION_FIRB**

The sub-processes in both is as follows:

- BIS - Investment Basel Asset Reclassification based on Party Type – IRB

- BIS - Investment Basel Asset Reclassification based on Product Type - IRB

9.1.2.5 Pre-mitigation Calculations

Some exposures can be hedged against credit risk through various mitigants like guarantors, collaterals, credit derivatives, and so on. These provide mitigation to credit risk and must be considered while computing Credit RWA as per Basel norms. Hence, the application calculates pre-mitigation risk-weighted assets amount and post-mitigation risk-weighted assets amount.

The application calculates the correlation factor using the formula specified for each asset class. Using Correlation factor, PD, and LGD, the application calculates the pre-mitigation capital charge for each exposure. This value signifies the capital charge the bank has to maintain for each exposure, prior to considering any mitigation effects.

The application calculates pre-mitigation exposure at default amount and risk weight for each exposure. Further, it computes pre-mitigation risk-weighted assets (Pre-CRM RWA) by multiplying the EAD by risk weight. The risk weight is arrived at by multiplying pre-mitigation capital charge with 12.5.

9.1.2.5.1   Exposure at Default Amount Calculation (different from STD)

Exposure at Default (EAD) is calculated for all the products. This is being computed using the Exposure Amount (EOP Balance of the Exposure)

This happens in the sub-process **INV_EAD_CALCULATION_IRB** in **Investment Data Processing – FIRB** and **Investment Data Processing –AIRB** processes

Post CRM EAD

Through the CRM process, the bank takes into account the effect of the mitigation and calculates the post-mitigation exposure at the default amount. This signifies the maximum loss that the bank can suffer in case of default on this exposure, after considering the effects of the mitigation. This will be the EAD of the Exposure Pre Mitigation less the covered portion of the mitigant

9.1.2.5.2   Capital Charge Rules (different from STD)

Two primary capital charge measures that differentiate IRB run from STD run are expected loss and unexpected loss calculations.

Unexpected Loss Calculations

Unexpected Loss is calculated as using the Probability of Default (PD), Loss Given Default (LGD), Effective Maturity (M) and Correlation Factor.

This is handled in the sub-process Non Sec Inv Pre-Mitigation Capital Required for UL in the process INV_CAPITAL_CALCULATION_IRB

PD Calculations

Probability of Default (PD) signifies the likelihood of a borrower failing to meet his/her financial obligations. In both FIRB and AIRB, PD values are expected as input/download from the bank. This is captured as part of the data population process.

There are certain flooring requirements and capping requirements, which are specified for each of the asset class.

This is handled in the sub process as below:

For FIRB - In the sub-process **INV_PD_LGD_ASSIGNMENT_FIRB** in the process **Investment Data Processing – FIRB**.

For AIRB - In the sub-process **INV_PD_LGD_ASSIGNMENT_AIRB** in the process **Investment Data Processing – AIRB**.

LGD Calculations

Loss Given Default (LGD) signifies the portion of the exposure that is likely to be lost in case the borrower defaults. In FIRB, LGD is computed by the application, as per the regulatory ask for each of the asset class. Moreover, in the case of AIRB, LGD is also expected as a download.

All PD and LGD calculations are handled in the process as below:

For FIRB - In the sub-process **INV_PD_LGD_ASSIGNMENT_FIRB** in the process **Investment Data Processing – FIRB**.

For AIRB - In the sub-process **INV_PD_LGD_ASSIGNMENT_AIRB** in the process **Investment Data Processing – AIRB**.

Effective Maturity Calculations

Effective maturity (M) will be 2.5 years for exposures to which the bank applies the foundation approach, except for repo-style transactions where the effective maturity is 6 months (ie M=0.5). Moreover, in the case of AIRB, this is expected to be provided by the bank using the modeling requirement.

The effective maturity (M) is subject to a floor of one year and a cap of 5 years

All maturity calculation are handled in the process as below:

For FIRB - In the sub-process **INV_MATURITY_CALCULATION_AND_ASSIGNMENT_FIRB** in the process **Investment Data Processing – FIRB.**

For AIRB - In the sub-process **INV_MATURITY_CALCULATION_AND_ASSIGNMENT_AIRB** in the process **Investment Data Processing – AIRB.**

Correlation Calculations

The correlation is being computed as per the requirement provided by the regulator by using all the inputs of PD, LGD, EAD and Effective Maturity.

As per the regulatory ask, the application assigns the multiplier of 1.25 to the Asset Value Correlation (AVC) of exposures wherever relevant. These exposures relate to regulated financial firms with assets of at least 100 billion USD and to exposures of unregulated financial firms (regardless of size). This is consumed in the correlation formulae applicable for the asset classes' specific calculation, as specified by the regulator.

This is calculated in the sub-process **Basel III Non Sec Inv Correlation Factor** in the process **INV_CAPITAL_CALCULATION_IRB.**

Expected Loss calculation

Expected loss is the loss, which the bank expects it will incur during the course of holding the exposure. This is mostly computed by using the attributes of PD, LGD and EAD.

This is calculated as the product of PD, LGD and EAD. This is applicable for most of the asset classes.

This is handled in the sub-process **Non Sec Inv Pre-Mitigation – EL** in the process **INV_RWA_CALCULATION_IRB.**

9.1.2.5.3   RWA Calculations

IRB approaches calculate RWA for pre mitigation RWA unexpected loss (**Non Sec Inv Pre-Mitigation RWA – UL**) as well as pre mitigation RWA expected loss (**Non Sec Inv Pre-Mitigation RWA - EL**).

These sub-processes are part of the process **INV_RWA_CALCULATION_IRB.**

9.1.2.6 Credit Risk Mitigation Process

9.1.2.6.1 Mitigant Approaches and their Risk weighting rules (different from STD)

The mitigant approaches applicable for IRB are only the Comprehensive Approach for Collateral recognition. This is same as in [Standardized Approach](#).

And in the case of unfunded mitigant in the form of guarantee and credit derivatives, the risk weights are calculated by using the PD of the mitigant provider, and the LGD of the covered exposure, and using the risk weight function as applicable for the mitigant asset class.

This is handled in the sub-process **CAP Collateral Eligibility for IRB Mitigants** in the process **Mitigant Collateral Eligibility – Comprehensive Approach – BIS.**

9.1.2.6.2 Mitigant Haircut Assignment

Under IRB approach, the bank can follow either supervisory estimates or banks estimate for Mitigant Haircut assignment. This is based on the various categories like mitigant type, residual maturity, rating, issuer type etc. This is applicable only if the bank follows comprehensive approach for collateral.

Only eligible mitigants are considered for haircut assignment and for further processing. Post haircut assignment, the eligible mitigants are moved from mitigants table (FSI_CAP_MITIGANTS) to sub exposures table (FSI_CAP_SUB_EXPOSURES).

The application does computations for three kinds of mitigant haircuts, which are volatility haircut, FOREX haircut, and maturity mismatch haircut.

Volatility Haircut

Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. The application assign haircuts for various type of financial collateral like debt securities, equity, mutual funds, and so on. In the supervisory haircut method, the application assigns volatility haircut based on issues, issuer's ratings, mitigant's residual maturity, and type of mitigant.

This is handled in **CAP CRM Mitigant Volatility Haircut - Supervisory Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

Forex Haircut

If the exposure and collateral are in different currencies, then the application makes an adjustment by applying the FOREX haircut.

This is handled in **CAP CRM Forex Haircut Sub Exposures** under **CRM Sub Exposure Data Haircut Assignment** process.

Maturity Mismatch Haircut

If the residual maturity of the Credit Risk Mitigant is less than that of the underlying credit exposure, then a maturity mismatch haircut is applied to adjust the value.

This is handled under **CAP CRM Maturity Mismatch Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

There are two methods for assigning volatility haircut:

- Supervisory Haircut

- Own Estimate

This is handled in the sub-process **CRM Sub Exposure Data Haircut Assignment** in the process **CRM Processing – Non Sec**.

- Supervisory Estimate

- For supervisory haircut method, the application assigns volatility haircut based on issuers, issuer's ratings, mitigants residual maturity, and type of mitigant, as recommended by the regulator

- Own Estimate (different from STD)

- For Own Estimate method, the application considers the banks own estimate values for haircut instead of using the supervisor's values.

9.1.3   Pooling and Optimizer

9.1.3.1   Pooling

Pooling is one of the pre-requisites for the optimized allocation of the exposures.

Pooling pulls out an exposure, and identifies all the relevant mitigants mapped to it, and the corresponding exposures mapped to these mitigants, and again the corresponding newer mitigants mapped to these exposures. This pooling assigns the cardinality to the exposures based on the mitigant combination.

This happens in the FSI Cap Sub Exposures (FSI_CAP_SUB_EXPOSURES), and the pooling is part of the sub process.

The relevant cardinalities that are assigned to the exposures, as part of this pooling process are as below:

- 1-0➔One exposure not mapped to any mitigant

- 1-1 ➔One exposure mapped to one mitigant

- 1-N➔One exposure mapped to multiple mitigants

- N-1 ➔Multiple exposures mapped to a single mitigant

- N-N ➔Multiple exposures mapped to multiple mitigants

9.1.3.2   Optimizer

The optimizer is the process of allocation of the mitigants to the exposures, based on the different logic applicable for the various granularity. The details of this is available in the [Annexure](#).

Both Pooling and Optimizer is handled under the process **CRM Sub Exposure Pooling and Optimizer Processing.**

9.1.3.2.1   Post CRM RWA

The application computes the covered amount and the uncovered amount for the exposures. The covered amount is computed by multiplying the covered factor with the exposure amount. To this covered amount, the application assigns the mitigant risk weight. The product of the covered amount and the mitigant risk weight is the covered RWA. The uncovered amount is computed by multiplying the uncovered factor (which is 1 – sum of all covered factors for that exposure) with the exposure amount. This uncovered amount is multiplied by the exposure risk weight to get the uncovered RWA. The sum of the covered RWA and the uncovered RWA is the Post CRM RWA of the Exposure.

Figure 73: Post CRM RWA

Post-CRM RWA = Covered Amount * Risk Weight of the Mitigant
+ Uncovered Amount * Risk Weight of the Exposure

9.2 Counterparty Credit RWA

Counterparty Credit RWA is explained in detail under the Counterparty Credit RWA section in this document

9.2.1 Derivatives Portfolio

9.2.1.1 Rating Population

The rating population in the case of IRB Approach is not relevant, and is used only for the mitigants, as they are used for the mitigant eligibility and supervisory haircut rules. This is explained in the Standardized Approach section.

9.2.1.2 Data Population

Data Population is explained in detail under the **Derivatives** Portfolio sub section of the Counterparty Credit RWA section in this document.

The process names for data population are

- DERIVATIVE_SWAPS_EXPOSURE_DATA_POPULATION

- DERIVATIVE_FUT_EXPOSURE_DATA_POPULATION

- DERIVATIVE_OPT_EXPOSURE_DATA_POPULATION

- DERIVATIVE_FORWARDS_EXPOSURE_DATA_POPULATION

- DERIVATIVE_CREDIT_DERIVATIVE_DATA_POPULATION

9.2.1.3 Shareholding Percent Multiplication

The shareholding percent multiplication for the various amounts associated with the exposure remains the same as in Standardized approach.

9.2.1.4 Common Reclassification Rules

The reclassification rules are consistently the same across all the approaches of the calculations. See Standardized Approach for more details on the same. This is happening in the process **DRV_RECLASSIFICATION_IRB (process)**

9.2.1.5 Asset Reclassification Rules

The asset reclassification is based on the various combinations of the Basel product type and the standard counterparty type and any other filters as relevant. This remains functionally the same as Standardized Approach.

For AIRB, Process Name: **DRV_RECLASSIFICATION_AIRB**

For FIRB Process Name: **DRV_RECLASSIFICATION_FIRB**

The sub-processes in both as follows:

BIS - Derivative Basel Asset Reclassification based on Party Type - STD

9.2.1.6   Pre-mitigation Calculations

Some exposures can be hedged against credit risk through various mitigants like guarantors, collaterals, credit derivatives, and so on. These provide mitigation to credit risk and must be considered while computing Credit RWA as per Basel norms. Hence, the application calculates pre-mitigation risk-weighted assets amount and post-mitigation risk-weighted assets amount.

The application calculates the correlation factor using the formula specified for each asset class. Using Correlation factor, PD, and LGD, the application calculates the pre-mitigation capital charge for each exposure. This value signifies the capital charge the bank has to maintain for each exposure, prior to considering any mitigation effects.

The application calculates pre-mitigation exposure at default amount and risk weight for each exposure. Further, it computes pre-mitigation risk-weighted assets (DRV_PRE_CRM_RISK-_WEIGHTED_ASSET_CALC) by multiplying the EAD by risk weight. The risk weight is arrived at by multiplying pre-mitigation capital charge with 12.5.

9.2.1.6.1   Exposure at Default Amount Calculation

The Exposure at Default amount for derivatives can be computed using either the approach of standardized Approach (SA CCR) or the Internal Model Method (IMM), based on the supervisory approval received by the bank.

This happens in the sub-process **DRV_EAD_CALCULATION_IRB** in **Derivative Data Processing,**

FIRB - DRV_EAD_CALCULATION_FIRB

AIRB - **DRV_EAD_CALCULATION_AIRB**

9.2.1.6.2   Methods for calculating EAD

There are two methods of computing EAD for banks following IRB Approach – Standardized Approach (SA CCR) and Internal Model Method (IMM).

Standardized Approach (SA CCR)

This is same as detailed in the [Standardized Approach](). This is applicable for all derivative exposures in the form of OTC derivatives, Cleared Transactions, Exchange Traded Derivatives and Long Settlement Transactions.

This is handled in the process DERIVATIVE_SACCR_EAD_CALCULATION.

Internal Model Method (IMM)

In the case of IMM Approach, the Exposure amount gets computed outside the application, by using the various cross product netting and other related calculation mechanism at a counterparty's portfolio level. And this is being provided as an input.

This is handled in the process **Derivative Pool EAD Calculation - OTC - Internal Model Method**

9.2.1.6.3 Post CRM EAD

Through the CRM process, the bank considers the effect of the mitigation and calculates the post-mitigation exposure at the default amount. This signifies the maximum loss that the bank can suffer in case of default on this exposure, after considering the effects of the mitigation. This will be the EAD of the Exposure Pre Mitigation less the covered portion of the mitigant

9.2.1.6.4 Capital Charge Rules

In the case of IRB Approach, the Capital charge is being computed for both unexpected loss as well as Expected loss.

Unexpected Loss Calculations

Unexpected Loss is calculated as using the Probability of Default (PD), Loss Given Default (LGD), Effective Maturity (M) and Correlation Factor.

This is handled in the sub-process **Derivative Pre-Mitigation Capital Required for UL**

For FIRB - in the process **DRV_CAPITAL_CALCULATION_FIRB**

For AIRB - in the process **DRV_CAPITAL_CALCULATION_AIRB.**

PD Calculations

Probability of Default (PD) signifies the likelihood of a borrower failing to meet his/her financial obligations. In both FIRB and AIRB, PD values are expected as input/download from the bank. This gets captured as part of the data population process.

There are certain flooring requirements and capping requirements which are specified for each of the asset class.

This gets handled in the sub process as below:

For FIRB - In the sub-process **PD_LGD_ASSIGNMENT_FIRB** in the process **Derivative Data Processing – FIRB**.

For AIRB - In the sub-process **PD_LGD_ASSIGNMENT_AIRB** in the process **Derivative Data Processing – AIRB**.

LGD Calculations

Loss Given Default (LGD) signifies the portion of the exposure that is likely to be lost in case the borrower defaults. In FIRB, LGD is computed by the application, as per the regulatory ask for each of the asset class. And in the case of AIRB, LGD is also expected as a download.

All PD and LGD calculations are handled in the process as below:

For FIRB - In the sub-process DRV_**PD_LGD_ASSIGNMENT_FIRB** in the process **Derivative Data Processing – FIRB**.

For AIRB - In the sub-process **PD_LGD_ASSIGNMENT_AIRB** in the process **Derivative Data Processing – AIRB**.

Effective Maturity Calculations

Effective maturity (M) will be 2.5 years for exposures to which the bank applies the foundation approach, except for repo-style transactions where the effective maturity is 6 months (i.e.

M=0.5). And in the case of AIRB, this is also expected to be provided by the bank using the modeling requirement.

The effective maturity (M) is subject to a floor of one year and a cap of 5 years

All maturity calculation are handled in the process as below:

For FIRB - In the sub-process **MATURITY_CALCULATION_AND_ASSIGNMENT_FIRB** in the process **Derivative Data Processing – FIRB.**

For AIRB - In the sub-process **MATURITY_CALCULATION_AND_ASSIGNMENT_AIRB** in the process **Derivative Data Processing – AIRB.**

Correlation Calculations

The correlation is being computed as per the requirement provided by the regulator by using all the inputs of PD, LGD, EAD and Effective Maturity.

As per the regulatory ask, the application assigns the multiplier of 1.25 to the Asset Value Correlation (AVC) of exposures wherever relevant. These exposures relate to regulated financial firms with assets of at least 100 billion USD and to exposures of unregulated financial firms (regardless of size). This gets consumed in the correlation formulae applicable for the asset class specific calculation, as specified by the regulator.

Capital Charge Calculations

The capital charge for the unexpected loss is computed using the regulatory provided calculation specific for the asset classes. This gets handled in the process as below:

For FIRB - in the process **CAPITAL_CALCULATION_FIRB**

For AIRB - in the process **CAPITAL_CALCULATION_AIRB**

Expected Loss calculation

Expected loss is the loss which the bank expects it will incur during the course of holding the exposure. This is mostly computed by using the attributes of PD, LGD and EAD.

This is calculated as the product of PD, LGD and EAD. This is applicable for most of the asset classes.

This is handled in the sub-process **Derivative Pre-Mitigation**

For FIRB **-** In the process **PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_FIRB**

For AIRB **-** In the process **PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_AIRB**

9.2.1.6.5   RWA Calculations

IRB approaches calculate RWA for dilution risk, Pre mitigation RWA unexpected loss (**Derivative Pre-Mitigation RWA – UL**) as well as pre mitigation RWA expected loss (**Derivative Pre-Mitigation RWA – EL**).

All these sub-processes can be found in the below process:

- For FIRB - In the process PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_FIRB

- For AIRB - In the process PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_AIRB

9.2.1.6.6 Post CRM RWA

Pre mitigation EAD is divided into Post Mitigation EAD for the covered portion and Post Mitigation EAD for uncovered portion. Covered portion is the portion of the exposure covered by the mitigant and uncovered portion is portion of the exposure not covered by the mitigant. There will be more than one record for the covered portion of that exposure. Post mitigation RWA UL (Post CRM RWA UL) is calculated by multiplying post mitigation EAD and its Capital Required UL. Post mitigation RWA Expected Loss is calculated by multiplying the PD, LGD, and post mitigation EAD amount.

The application computes the covered amount and the uncovered amount for the derivative exposures at the nettable pool and mitigant level combination. The same is being carried back to the nettable pool level, and hence to the exposure level.

The covered amount is computed by multiplying the covered factor with the exposure amount. To this covered amount, the application assigns the mitigant risk weight. The product of the covered amount and the mitigant risk weight is the covered RWA. The uncovered amount is computed by multiplying the uncovered factor (which is 1 – sum of all covered factors for that exposure) with the exposure amount. This uncovered amount is multiplied by the exposure risk weight to get the uncovered RWA. The sum of the covered RWA and the uncovered RWA is the Post CRM RWA of the exposure.

Post CRM EAD + Post CRM EL Amount + Post CRM Capital UL

See Post CRM RWA Calculations for more information.

9.2.2 Securities Financing Transactions Portfolio

Securities Financing Transactions (SFT) include Repo Style transactions, Margin Lending, Security Financing Borrowing, and so on. Under IRB method we have two approaches -1. VaR approach – this is the approach wherein the EAD will be the effective exposure amount and there won't be a need of EAD calculation. and 2. Comprehensive approach – this is the approach wherein the collateral undergoes haircut treatment and the exposure value gets reduced from this portion

For all SFT contracts which have a placed collateral or mitigant mapped to it, the application computes CRM based on the RWA approach undertaken by the bank.

Process Flow for Credit Risk Securities Financing Transactions

Figure 74: Process Flow for Credit Risk Securities Financing Transactions

```
┌─────────────────────────────┐
│     SFT Data Population      │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│   SFT Collateral data       │
│        population           │
│   • Posted Collateral       │
│   • Received Collateral     │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│      SFT Asset class        │
│      reclassification       │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│     SFT EAD Calculation     │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│     Multiple Assessment     │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│   Issue Issuer Assessment   │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│    Risk Weight Assignment   │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│    Collateral Multiple      │
│        Assessment           │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│   Collateral Risk Weight    │
│        Assignment           │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│  Haircut Assignment for SFT │
│        Collaterals          │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│    Pre Mitigation Post      │
│   Volatility Haircut EAD    │
│    Amount Calculation       │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│    Nettable Pool Data       │
│        population           │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│   Pre Mitigation RWA        │
│     Unexpected Loss         │
│  calculation for the pool   │
└─────────────────────────────┘
```

9.2.2.1   Rating Population

The rating population in the case of IRB Approach is not relevant and is used only for the mitigants and placed collateral, as they are used for the mitigant eligibility rules.

Rating population is handled as part of the BIS Common Data Processing in the sub process Credit Rating Data Population. See [Standardized Approach](#) for the details.

9.2.2.2   Data Population

Data Population is handled as part of the sub process SFT_DATA_POPULATION under the process SFT Data Processing.

The data population remains the same as in [Standardized Approach](#).

In addition to the Product Processor tables, FSI Setup Account Modeling Information (FSI_SETUP_ACCT_MODELING_INFO) is used for providing the input required for the Capital charge calculation, and which are based on the bank's specific models. Some of the attributes picked up from this table are PD, LGD in the case of AIRB approach, Effective Maturity, CCF Own Estimate (in the case of AIRB approach) etc.

9.2.2.3 Shareholding Percent Multiplication

The shareholding percent multiplication for the various amounts associated with the exposure remains the same as in Standardized Approach.

This is handled as part of the sub process Common Data Processing under BIS Common Data Processing

9.2.2.4 Common Reclassification Rules

The reclassification rules are consistently the same across all the approaches of the calculations. This is same as in Standardized Approach.

This is handled as part of the sub process COMMON_RECLASSIFICATION under Common Data Processing process.

9.2.2.5 Asset Reclassification Rules

The asset reclassification is based on the various combinations of the Basel product type and the standard counterparty type and any other filters as relevant. This remains functionally the same as in Standardized Approach.

This is handled in sub process SEC_RECLASSIFICATION_IRB under the process SFT_DATA_PROCESSING_FIRB or SFT_DATA_PROCESSING_AIRB

9.2.2.6 Pre-mitigation Calculations

9.2.2.6.1 Exposure at Default Amount Calculation

Pre-mitigation Exposure at Default can be calculated using one of the two approaches of EAD – VaR Approach and Comprehensive Approach. This is based on run management selection.

9.2.2.6.2 Calculation of EAD – Comprehensive Approach

This is same as detailed in the Standardized Approach. This is applicable for all SFT exposures.

This is handled in the process SFT_DATA_PROCESSING_FIRB for FIRB or SFT_DATA_PROCESSING_AIRB for AIRB and the sub process is SFT_EAD_CALC_IRB.

9.2.2.6.3 Calculation of EAD - VaR Method

For the Calculation of EAD under VaR Method, if the exposure is part of the netting set level then the EAD will be based on the effective exposure amount of the netted pool i.e aggregated at the counterparty level.

This is handled as part of the SFT_NETTING_CALCULATION and if the exposure is other than the netting set the EAD will be on the effective exposure amount of the each exposure level.

This is part of the process SFT_EXP_AND_PLACED_COLLATERAL_PROCESSING_STD if the exposures are not part of netting agreement.

9.2.2.6.4 Capital Charge Rules

In the case of IRB Approach, the Capital charge is being computed for both unexpected loss as well as Expected loss.

Unexpected Loss Calculations

Unexpected Loss is calculated as using the Probability of Default (PD), Loss Given Default (LGD), Effective Maturity (M) and Correlation Factor.

This is handled in the sub-process

For FIRB - in the process **SFT_CAPITAL_CALCULATION_FIRB**

For AIRB - in the process **SFT_CAPITAL_CALCULATION_AIRB.**

The capital charge rules are applicable if the comprehensive approach is selected and the same is handled in the sub process SFT_DATA_PROCESSING_FIRB or SFT_DATA_PROCESSING_AIRB and in case of the VaR approach the application handles in different way under the sub process SFT_PROCESSING_INTERNAL_MODEL_METHOD.

The LGD calculation will be applicable for the both the Comprehensive and VaR approaches.

But the PD , Effective Maturity calculations and Asset value co relation calculations are applicable only under Comprehensive approach.

PD Calculations

Probability of Default (PD) signifies the likelihood of a borrower failing to meet his/her financial obligations. In both FIRB and AIRB, PD values are expected as input/download from the bank. This gets captured as part of the data population process.

There are certain flooring requirements and capping requirements which are specified for each of the asset class.

This gets handled in the sub process as below:

For FIRB - In the sub-process **PD_LGD_ASSIGNMENT_FIRB** in the process **SFT Data Processing – FIRB**.

For AIRB - In the sub-process **PD_LGD_ASSIGNMENT_AIRB** in the process **SFT Data Processing – AIRB**.

LGD Calculations

Loss Given Default (LGD) signifies the portion of the exposure that is likely to be lost in case the borrower defaults. In FIRB, LGD is computed by the application, as per the regulatory ask for each of the asset class. And in the case of AIRB, LGD is also expected as a download.

All PD and LGD calculations are handled in the process as below:

For FIRB - In the sub-process **PD_LGD_ASSIGNMENT_FIRB** in the process **SFT Data Processing – FIRB**.

For AIRB - In the sub-process **PD_LGD_ASSIGNMENT_AIRB** in the process **SFT Data Processing – AIRB**.

In case if the VaR approach is selected under the run management selection the LGD assignment is handled as part of the sub process SFT_PROCESSING_INTERNAL_MODEL_METHOD.

Effective Maturity Calculations

Effective maturity (M) will be 2.5 years for exposures to which the bank applies the foundation approach, except for repo-style transactions where the effective maturity is 6 months (ie M=0.5). And in the case of AIRB, this is also expected to be provided by the bank using the modeling requirement.

The effective maturity (M) is subject to a floor of one year and a cap of 5 years

All maturity calculation are handled

For FIRB - In the sub-process **SFT_MATURITY_ASSIGNMENT_FIRB** in the process **SFT Data Processing – FIRB.**

For AIRB - In the sub-process **SFT_MATURITY_ASSIGNMENT_FARB** in the process **SFT Data Processing – AIRB.**

Correlation Calculations

The correlation is being computed as per the requirement provided by the regulator by using all the inputs of PD, LGD, EAD and Efffective Maturity.

As per the regulatory ask, the application assigns the multiplier of 1.25 to the Asset Value Correlation (AVC) of exposures wherever relevant. These exposures relate to regulated financial firms with assets of at least 100 billion USD and to exposures of unregulated financial firms (regardless of size). This gets consumed in the correlation formulae applicable for the asset classes specific calculation, as specified by the regulator.

For FIRB - In the sub-process **SFT_CAPITAL_CALCULATION_FIRB** in the process **SFT Data Processing – FIRB.**

For AIRB - In the sub-process **SFT_CAPITAL_CALCULATION_AIRB** in the process **SFT Data Processing – AIRB.**

Capital Charge Calculations

The capital charge for the unexpected loss is computed using the regulatory provided calculation specific for the asset classes. This gets handled in the process as below:

For FIRB - In the sub-process **SFT_CAPITAL_CALCULATION_FIRB** in the process **SFT Data Processing – FIRB.**

For AIRB - In the sub-process **SFT_CAPITAL_CALCULATION_AIRB** in the process **SFT Data Processing – AIRB.**

Expected Loss calculation

Expected loss is the loss which the bank expects it will incur during the course of holding the exposure. This is mostly computed by using the attributes of PD, LGD and EAD

This is calculated as the product of PD, LGD and EAD. This Is applicable for most of the asset classes.

This is handled in the sub-process **SFT_RISK_WEIGHT_ASSET_CALCULATION_FIRB or SFT_RISK_WEIGHT_ASSET_CALCULATION_AIRB.**

9.2.2.6.5 **RWA Calculations**

IRB approaches calculate RWA for unexpected loss (**SFT Pre-Mitigation RWA – UL**) as well as pre mitigation RWA expected loss (**SFT Pre-Mitigation RWA – EL**).

All these sub-process can be found in the below process:

For FIRB **-** In the process **PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_FIRB**

For AIRB **-** In the process **PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_AIRB**

9.2.3 Pooling and Optimizer

9.2.3.1 Pooling

Pooling is one of the pre-requisites for the optimized allocation of the exposures.

Pooling pulls out an exposure, and identifies all the relevant mitigants mapped to it, and the corresponding exposures mapped to these mitigants, and again the corresponding newer mitigants mapped to these exposures. This pooling assigns the cardinality to the exposures based on the mitigant combination.

This happens in the FSI Cap Sub Exposures (FSI_CAP_SUB_EXPOSURES), and the pooling is part of the sub process

The relevant cardinalities that get assigned to the exposures, as part of this pooling process are as below:

- 1-0➔One exposure not mapped to any mitigant

- 1-1 ➔One exposure mapped to one mitigant

- 1-N➔One exposure mapped to multiple mitigants

- N-1 ➔Multiple exposures mapped to a single mitigant

- N-N ➔Multiple exposures mapped to Multiple mitigants

9.2.3.2 Optimizer

The optimizer is the process of allocation of the mitigants to the exposures, based on the different logic applicable for the various granularity. The details of this is available in the Annexure.

Both Pooling and Optimizer is handled under the process **CRM Sub Exposure Pooling and Optimizer Processing.**

9.2.3.3 Post CRM RWA

The application computes the covered amount and the uncovered amount for the exposures. The covered amount is computed by multiplying the covered factor with the exposure amount. To this covered amount, the application assigns the mitigant risk weight. The product of the covered amount and the mitigant risk weight is the covered RWA. The uncovered amount is computed by multiplying the uncovered factor (which is 1 – sum of all covered factors for that exposure) with the exposure amount. This uncovered amount is multiplied by the exposure risk weight to get the uncovered RWA.

The sum of the covered RWA and the uncovered RWA is the Post CRM RWA of the Exposure.

Post-CRM RWA = Covered Amount * Risk Weight of the Mitigant
+ Uncovered Amount * Risk Weight of the Exposure

9.3   Default Fund Contributions Related Capital Charge

A default fund contribution refers to the funds contributed or commitments made by a clearing member to a Central Counterparty's (CCP) equalized loss sharing agreement. The purpose of such default funds is to provide capital, in addition to the collateral posted by participants and in addition to capital provided by the clearinghouse, as a safeguard against extraordinary losses that might occur in connection with.

For example a financial crisis in the market or the simultaneous defaults of several large members. The clearing members contribute to such default funds kept with the central counterparty (clearing house) in the proportion of their exposure to the central counterparty.

The default fund contributions by the clearing members contribute toward the central counterparty's regulatory capital along with CCP's own contributions to the default fund. These contributions act as collaterals to mutually share in the losses incurred by the clearing members due to counterparty defaults.

For each clearing member, a contribution is made to the central counterparty's default fund.

This contribution acts as a relief's against the defaults by any clearing member of the central counterparty.

CRR IV explains the methods that the banking organization playing the part of a clearing member of the CCP, must adopt and compute risk-weighted assets (RWA) for a non-qualifying and a qualifying CCP.

The application handles the treatment of exposures to a QCCP and a Non-QCCP. This qualified CCP flag is expected to be provided as a download in the Party Master (**STG_PARTY_MASTER**) table.

9.3.1   Capital Charge for Non-QCCP

If the CCP is not a qualified CCP (Non-QCCP), then the risk-weighted asset amount for the banking organization's default fund contribution is calculated using the Own funds requirements for pre-funded contributions to the default fund of a non-qualifying CCP approach, as suggested in the accord.

9.3.2   Capital Charge for QCCP

If the CCP is a qualified CCP (QCCP), then the RWA amount is computed using one of the following two approaches stated below. Both are handled in the same Sub process - RWA For Default Fund Contribution With QCCP. This is based on the run management option selected.

- Own funds requirements for pre-funded contributions to the default fund of a QCCP.

- Alternative calculation of own funds requirement for exposures to a QCCP.

The approach to use of either the own fund requirements for QCCP or the alternative approach of the own fund requirements for QCCP is based on the run management option.

Approach 1

For the purpose of computing the clearing member's capital requirement, which is the reporting bank's capital requirement for the contributions made to the CCP's default fund, the hypothetical capital requirement of the central counterparty for the default fund must be known. This must be computed by

the central counterparty based on the exposures of all the clearing members to the default fund. After this figure is calculated by the CCP, it is shared with all the clearing members to enable them and to compute their respective capital requirements against the default fund.

When the reporting bank gets the hypothetical capital requirement from the QCCP, next step is to compute the capital requirement of the reporting bank by finding out the proportion of the reporting bank's contribution in the total default fund contribution.

- The parameters considered for this purpose include the following QCCPs:

- Net potential exposure to the two largest clearing members,

- The total net potential exposure to all the clearing members,

- Total default fund contribution by all the clearing members,

- QCCP's own contribution to the default fund, and

- The total number of clearing members for the default fund.

The last step is to compute the risk-weighted assets of the reporting bank corresponding to the default fund contribution to the QCCP by using the capital computed in the previous step.

These steps and the calculation involved are the following:

Step 1:

It requires the QCCP to calculate its hypothetical capital requirement (KCCP) for the default fund. This is done by the QCCP and is published to the clearing members for them to use for their respective capital calculations.

Step 2:

Compare KCCP with the funded portion of the default fund of a QCCP and calculate the capital requirement of the bank (KCM) by using the total of all the clearing members' capital requirements (K*CM). This capital requirement is considered on the contribution that the clearing members make to the default fund of the QCCP.

Approach 2

Capital Charge for the default fund contribution is calculated as follows:

Capital charge (Ki) = 8% * minimum (2% of Trade exposures to the QCCP + 1250% * default fund contribution to the QCCP, 20% * Trade Exposure Amount to the QCCP).

The solution also supports the treatment of a CCP stopping to calculate its own fund requirement to the CCP. The flag to indicate that the CCP has stopped calculating the own fund requirement is captured in the party table (**STG_PARTY_MASTER**). And based on the supervisory approval provided, in the run management option, the capital wil be calculated using the Alternative approach. Else, it is treated as a normal Credit Risk Exposure, part of the Corporate Asset class.

The flag to indicate that the CCP has stopped calculating the capital requirement is expected as part of the Party Master Table (**STG_PARTY_MASTER**). In the case of this flag being null, it is expected that the CCP is calculating the Total Capital and normal processing of QCCP or Non-QCCP happens.

Key Data Elements

Key data elements to be noted are listed in this section. To view the complete list of tables used, see the Download Specification document in MOS.

- Default fund contributions and related data are expected at Default fund – Central Counterparty level in the entity Stage Central Counterparty Details (STG_CCP_DETAILS).

- Hypothetical Capital Requirement of CCP, Maximum Net Potential Exposure of clearing member of CCP, 2nd Maximum Net Potential Exposure of clearing member of CCP, Total Net Potential Exposure of clearing member of CCP, Number of Clearing Members to the CCP, Total funded Default Fund Contribution of all clearing members to the CCP, Total unfunded Default Fund Contribution of all clearing members to the CCP and Default fund contribution of CCP from its own funds for each central counterparty level required.

- Application supports only the capital requirement of the bank (KCM) based on Funded/Unfunded default contributions from all clearing members not by Initial Margin. But data model supports place holders to capture Total Initial Margin by all clearing members to CCP and Bank's initial margin posted to CCP.

9.4 Credit RWA for Securitization

As per the revised guidelines for securitization framework, which is focused on addressing the short comes of the existing guidelines, a revised hierarchy of approaches that replaces the existing approaches have been introduced.

The application assigns the appropriate approach to the exposures, based on the criteria specified in the Revised guidelines. The application assigns any of the below approaches under securitization standardized approach:

- Sec- Internal Ratings Based Approach (SEC-IRBA) - SSFA

- Sec- External Ratings Based Approach (SEC-ERBA)

- Sec -IAA Approach

- Sec 1250% RW

9.4.1 Data Population

Data Population is explained in detail under the Data Population of the Credit RWA for Securitization section in this document.

9.4.2 Shareholding Percent Multiplication

Shareholding Percent Multiplication is explained in detail under the Shareholding Percent Multiplication of the Credit RWA for Securitization section in this document.

9.4.3 Common Reclassification Rules

Common Reclassification Rules is explained in detail under the Common Reclassification Rules of the Credit RWA for Securitization section in this document.

9.4.4 Exposure at Default Amount Calculation

Exposure at Default process is explained in detail under the Exposure at Default Calculation of the Credit RWA for Securitization in this document.

9.4.5 Risk Weight Assignment Rules

9.4.5.1 Hierarchy of Approaches

As per the revised guidelines for securitization framework, which is focused on addressing the short comes of the existing guidelines, a revised hierarchy of approaches that replaces the existing approaches have been introduced.

The application assigns the appropriate approach to the exposures, based on the criteria specified in the Revised guidelines. The application assigns any of the three approaches under securitization:

- Sec-Internal Rating Based Approach (SEC-IRBA) – This is applicable for the exposures only if the underlying information is completely available.

- Sec-External Ratings Based Approach (SEC-ERBA) – This is based on supervisory approval and SEC 1250% is applicable.

- SEC – Internal Assessment Approach (SEC- IAA)

- SEC 1250% is applicable.

This is handled as part of the sub process SEC_APPROACH_IDENTIFICATION_AND_ASSIGNMENT under the process SEC_DATA_PROCESSING_IRB.

All the calculations happens as per the approaches are given below and they are part of the process SEC_DATA_PROCESSING_IRB

9.4.5.1.1 SEC – IRB

SEC-IRBA is the first approach to be calculated. The model that is used to calculate capital charge (KIRB) for underlying exposures using IRB is Simplified Supervisory Formula Approach (SSFA). For exposures which follow the sec-internal ratings-based approach, the application calculates the underlying weighted average capital of the securitization pool (KIRB).

The below sub process handles the KIRB calculation

SEC_KIRB_AVAILABLE_PCT_CALCULATION under the process SEC_DATA_PROCESSING_IRB

 Further, the application calculates the required parameters based on the pool and tranche details. The application calculates these, using the logic specified by the accord. It also checks the exposure to identify whether the exposure must be straddled or not.

This check is based on the credit enhancement level of the tranche to which the exposure belongs to, the thickness of the tranche to which the exposure belongs to, and the underlying capital of the securitization pool. After all the parameters are calculated application computes SSFA capital and uses below mentioned logic for risk weight computation. The exposures for which are detachment point less than that of the KIRB, the exposures are risk-weighted at 1250%. The exposures for which the credit enhancement level is more than that of the KIRB, the exposures have the SSFA capital charge computed as per the formulae suggested in the accord. The exposures for which the credit enhancement level is less than that of the KIRB but the sum of the credit enhancement level and the tranche thickness are more than the KIRB, the exposures are straddled, and that is, the tranche to which the exposure belongs is split into a position below KIRB and a position above KIRB. All the exposures mapped to the straddled tranche are also split by the application in the same proportion as the split tranche. Post straddling risk weight is computed using the computation logic mentioned by the accord.

Once after the risk weights are assignment based on the above mentioned process the application calculates the SEC_RISK_WEIGHT_CALCULATION under the process SEC_DATA_PROCESSING_IRB.

9.4.5.1.2 SEC – ERBA

SEC - ERBA is explained in detail under the SEC - ERBA of the Credit RWA for Securitization section in this document.

9.4.5.1.3 SEC – IAA

SEC - IAA is explained in detail under the SEC - IAA of the Credit RWA for Securitization section in this document.

9.4.5.1.4 SEC – STD

SEC - STD is explained in detail under the SEC - STD of the Credit RWA for Securitization section in this document.

9.4.5.1.5 Re-securitization Exposures

Re-securitization Exposures is explained in detail under the Re-securitization Exposures of the Credit RWA for Securitization section in this document.

This happens in the sub process RESEC_POOL_RW_CALCULATIONS under the process SEC_DATA_PROCESSING_IRB

9.4.6 Sec Pre-CRM RWA Computation

RWA Calculations is explained in detail under the RWA Calculations of the Credit RWA for Securitization section in this document.

This is handled in application under SEC_PRE_CRM_CAPITAL_CHARGE_IRB

9.4.7 Credit Risk Mitigation Process

9.4.7.1 Mitigant Eligibility

Mitigant Eligibility is explained in detail under the Mitigant Eligibility of the Credit RWA for Securitization section in this document.

9.4.7.2 Mitigant Approaches and their Risk Weighting Rules

Mitigant Approaches and their Risk weighting Rules is explained in detail under the Mitigant Approaches and their Risk weighting Rules of the Credit RWA for Securitization section in this document.

9.4.7.3 Mitigant Haircut Assignment

Mitigant Haircut Assignment is explained in detail under the Mitigant Haircut Assignment Rules of the Credit RWA for Securitization section in this document.

9.4.8   Pooling and Optimizer

9.4.8.1   Pooling

Pooling is one of the pre-requisites for the optimized allocation of the exposures.

Pooling pulls out an exposure, and identifies all the relevant mitigants mapped to it, and the corresponding exposures mapped to these mitigants, and again the corresponding newer mitigants mapped to these exposures. This pooling assigns the cardinality to the exposures based on the mitigant combination.

This happens in the FSI Cap Sub Exposures (FSI_CAP_SUB_EXPOSURES), and the pooling is part of the sub process

The relevant cardinalities that get assigned to the exposures, as part of this pooling process are as below:

- 1-0➜One exposure not mapped to any mitigant
- 1-1 ➜One exposure mapped to one mitigant
- 1-N➜One exposure mapped to multiple mitigants
- N-1 ➜Multiple exposures mapped to a single mitigant
- N-N ➜Multiple exposures mapped to Multiple mitigants

9.4.8.2   Optimizer

The optimizer is the process of allocation of the mitigants to the exposures, based on the different logic applicable for the various granularity. The details of this is available in the Annexure.

Both Pooling and Optimizer is handled under the process **CRM Sub Exposure Pooling and Optimizer Processing.**

9.4.8.3   Post CRM RWA

The application computes the covered amount and the uncovered amount for the exposures. The covered amount is computed by multiplying the covered factor with the exposure amount. To this covered amount, the application assigns the mitigant risk weight.

Post-CRM RWA = Covered Amount * Risk Weight of the Mitigant + Uncovered Amount * Risk Weight of the Exposure.

The product of the covered amount and the mitigant risk weight is the covered RWA. The uncovered amount is computed by multiplying the uncovered factor (which is 1 – sum of all covered factors for that exposure) with the exposure amount. This uncovered amount is multiplied by the exposure risk weight to get the uncovered RWA. The sum of the covered RWA and the uncovered RWA is the Post CRM RWA of the Exposure. This logic is handled in Sec Post CRM RWA calculation sub process.

9.5   Market Risk RWA

For information on Market Risk RWA, see section Market Risk RWA.

9.6 Operational Risk RWA

For information on Operational Risk RWA, see section Operational Risk Portfolio.

9.7 Capital Structure

For information on Capital Structure, see section Capital Structure.

9.7.1 Provision calculation changes specific for IRB

For IRB, the application also compute General provision, total provision, Estimated loss greater than provisions specific to IRB and excess of total eligible provision which will be part of gross T2.

And this is handled inside the sub process PROVISION_CALCULATION (PMFBISCS005) in Capital Structure Data Processing (PMFBISCS021) process.

9.8 Capital Buffer

For information on Capital Buffer, see section Capital Buffers.

9.9 Large Exposures

For information on Large Exposures, see section Large Exposures.

9.10 Leverage Ratio

For information on Leverage Ratio, see section Leverage Ratio.

10 European Union CRR II Standardized Approach

Capital Adequacy guidelines as issued in the following regulations are incorporated in OFS Financial Services Basel Regulatory Capital:

The European Banking Association (EBA) in conjunction with the European Council and the European Parliament has issued the CRD IV and CRR IV rule which encompasses the entire Regulations to be followed by the Banks. These regulations are by and large compliant with the Basel III changes issued by the Basel Committee (BIS).

The OFS Financial Services Basel Regulatory Capital application incorporates the Capital Requirements Regulation IV (CRR IV) issued by the European Union on 26th June 2013. The application is compliant with the Standardized approach for European Jurisdiction.

This approach covers the following topics:

- Credit RWA

- Counterparty Credit RWA

- Default Fund Contributions Related Capital Charge

- Underlying Exposures Treatment Related to CIU and Secutization

- Operational Risk RWA

- Capital Structure

- Capital Buffers

- Large Exposures

- Leverage Ratio

10.1 Credit RWA

Credit RWA is the calculation of Non-securitization RWA

This includes the portfolio of banking and investment for the non-securitized exposures and securitization portfolio for the securitization positions. The application complies with the standardized approach and IRB approach of the credit risk calculations.

A few processes such as Credit Rating, Party Type Reclassification, and Mitigant Data Population are common between. Credit RWA and Counterparty Credit RWA.

This also includes the settlement risk calculation about the unsettled transactions depending on the number of days they are unsettled.

10.1.1 Banking Portfolio

10.1.1.1 Rating Population

The data on ratings is captured in the following rating specific tables:

- Account Rating Table (**STG_ACCOUNT_RATING_DETAILS**)

- Ratings of all Credit Risk Banking Exposures are captured in this table.

- Party Rating Table (**STG_PARTY_RATING_DETAILS**)

  - Credit Rating for all customers and issuers are captured in this table.

- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)

  - Credit Rating for all countries is captured in this table.

10.1.1.2   Processing Steps

Banks obtain credit ratings from different sources and these are provided as an input in the application through the rating tables mentioned in the preceding list.

This is handled in the sub-process **RATING_RECLASSIFICATION_POPULATION** in **BIS Other Reclassifications** process**.**

The application re-classifies the rating information to BIS Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short Term ratings.

This is handled in the sub-process **Credit Rating Reclassification** in **BIS Other Reclassifications** process**.**

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables.

Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

Ensure that all the columns as indicated in the DL Specs are mandatorily populated with data. For example, in the Stage Party Rating Details (**STG_PARTY_RATING_DETAILS)** table: Rating source code (**V_RATING_SRC_CODE**), Party Code (**V_PARTY_CD**), Purpose (**V_PURPOSE**) are required to be populated. The purpose code is to indicate whether the rating is a domestic rating or foreign rating. If any other rating is provided, then the exposure is considered as unrated.

10.1.1.3   Data Population

Credit Risk exposures are updated in the application for all the product types through their respective input tables known as Product Processors. Main categories of Credit Risk Banking exposures, along with their respective table names that are used as an input, are as follows:

Product	Source Product Processor
Assets Sold	STG_ASSETS_SOLD
Bills	STG_BILLS_CONTRACTS
Credit Cards	STG_CARDS
Guarantees	STG_GUARANTEES
Lease Contracts	STG_LEASE_CONTRACTS
Letters of Credit	STG_LC_CONTRACTS
Line of Credit	STG_CREDIT_LINE_DETAILS
Commitment Contracts	STG_COMMITMENT_CONTRACTS
Loans	STG_LOAN_CONTRACTS
Overdraft	STG_OD_ACCOUNTS

There is a data population about the mitigants, which cater to all the types of mitigants like collateral, guarantee, and credit derivatives. There is one data population about the counter-guarantee for the guarantor.

Product	Source Product Processor
Mitigants – Collateral, Guarantee, Credit Derivatives	STG_MITIGANTS
Counter Guarantee	STG_MITIGANT_COUNTER_GUARANTEE

There is a data population about the mapping between the exposures and the mitigants.

Product	Source Table
Mapping for Exposures and Mitigants	STG_ACCOUNT_MITIGANT_MAP

Processing table details

All Credit Risk Banking exposures are loaded into the table, FSI Cap Banking Exposures (**FSI_CAP_BANKING_EXPOSURES)** where further processing happens for this portfolio of exposures till the computation pertaining to Pre-Credit Risk Mitigation process

This is handled in the process **Banking Data Population**.

10.1.1.4 Shareholding Percent Multiplication

Shareholding percent multiplication for common entity level data is a part of **BIS Common Data Processing** (PMFCOM020) process. In this the application updates the shareholding percentage against each entity is updated with the value of 1 as the shareholding percent and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PERCENT).

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity with respect to parent entity against exposure amount, undrawn amount and provision amount for that exposure and update the same.

This is handled in the sub-process **BNK_SHAREHOLDING_CALCULATION_STD of the process Banking Data Processing – STD**.

10.1.1.5 Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, the asset class for each exposure is arrived at. Similarly, the application does reclassification for mitigant based on its mitigant types and reclassifies it to standard mitigant types.

Ensure that all products and party type and mitigants which are bank-specific are reclassified, as part of the setup activity. If they are not reclassified, the treatment might not happen as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product types. For Example, Housing Loan is reclassified as Residential Mortgage Exposure.

This is handled in the Basel Product Type Reclassification which is part of the COMMON_RECLASSIFICATION process.

Party Type Reclassification

Similar to the product type, the customer type (which are stored as counterparty type) are also reclassified as standard counterparty type. The customer information is expected in the Stage Party Master (STG_PARTY_MASTER), and this also includes the Party Type based on the Stage Party Type Master (STG_PARTY_TYPE_MASTER).

Party type reclassification Rules handle reclassification for customer types. For Example, an Individual is reclassified as Retail.

This is handled in the Party Type Reclassification which is part of BIS Other Reclassification process.

Other Reclassification

As part of the reclassification rules, any other data which is being brought inside the application like seniority, transaction type and so on also get reclassified into OFSAA specific values. This is also mandatory to be done, as otherwise data will not be available for processing as required by the regulator. This happens as part of the process COMMON_RECLASSIFICATION.

10.1.1.6 Asset Reclassification Rules

Based on Basel product type and standard counterparty type, an asset class is formed by the application. This asset class is used for data processing. The asset class is the same as specified in the accord.

For example, Standard counterparty is Corporate non-SME and Corporate SME, the asset class is corporate. For Basel product type Residential Mortgage Exposure, the asset class is Claims Secured by Residential Real Estate.

The asset class for all mitigants is reclassified based on their standard mitigant types and standard issuer type.

This happens in the **BNK_RECLASSIFICATION_STD** sub-process of the process **Banking Data Processing**.

10.1.1.7   Pre-mitigation Calculations

Based on the asset class, the application calculates the Pre-Credit Risk Mitigation (CRM) Exposure at Default (EAD) for each exposure. This value signifies the maximum loss that the bank can suffer, in case of default on this exposure, before considering any mitigation effects.

Some exposures can be hedged against credit risk through various mitigants such as guarantees, collaterals, credit derivatives, and so on. These provide mitigation to credit risk and must be considered while computing Credit RWA, as per the Accord. Hence, the application calculates the pre-mitigation exposure amount and post-mitigation exposure amount.

The application also computes pre-mitigation risk-weighted assets (Pre CRM RWA) and post-mitigation risk-weighted assets (Post CRM RWA) by multiplying the respective EAD by risk weight. The risk weight is arrived at, by considering the credit rating of the exposures and mitigants as per the guidelines.

10.1.1.7.1   Exposure at Default Amount Calculation

Pre CRM EAD

Exposure at Default (EAD) is calculated for all the products. This is being computed using the Exposure Amount (EOP Balance of the Exposure), Undrawn Amount of the Exposure (Undrawn Amount) and the Credit Conversion Factor for the Off-Balance sheet Amount (CCF). This is computed for the on-balance sheet products separately, and the off-balance sheet products separately.

This happens in the sub-process BNK_PRE_CRM_EAD_COMPUTATION_STD in Banking Data Processing – STD process.

Credit Conversion Factor (CCF Assignment)

This is an input required for converting the off-balance sheet component of the exposure (undrawn portion associated with an on-balance sheet or off-balance sheet product, or the exposure amount of an off-balance sheet product). This is based on the supervisory provided values and is determined based on the product type and the maturity associated with the exposure.

This populates the Drawn CCF (for the CCF to be assigned to the exposure amount of the off-balance sheet product) and the Undrawn CCF (for the CCF to be assigned to the undrawn portion of the on balance sheet and off balance sheet exposures).

This happens in the process BNK_CCF_ASSIGNMENT_STD in Banking Data Processing – STD process.

Post CRM EAD

Through the CRM process, the bank considers the effect of the mitigation and calculates the post-mitigation exposure at the default amount. This signifies the maximum loss that the bank can suffer in case of default on this exposure, after considering the effects of the mitigation. This will be the EAD of the Exposure Pre-Mitigation less the covered portion of the mitigant

10.1.1.7.2   Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment process. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessment are first moved into the table FSI Multiple Rating Processing (FSI_MULTIPLE_RATING_PROCESSING) wherein the ranking and final selection of which rating to use takes place.

This happens in the sub process of BNK_MULTIPLE_ASSESSMENT_PROCESSING_DATA_POPULATION, wherein the data for the multiple assessment processing gets populated into the FSI table. MULTIPLE_RATING_ASSESSMENT, wherein the identification of the multiple rating for the exposure happens, and the BNK_MULTIPLE_ASSESSMENT_BASED_RISK_WEIGHT_ASSIGNMENT wherein the actual risk weight and final rating assignment happens for the exposures.

All the above fall under in Banking Data Processing – STD process.

10.1.1.7.3   Issue Issuer Assessment

For all the exposures which remain unrated after the multiple assessment processes, the issue issuer process is performed. This happens in the Issue Issuer Assessment sub-process (**BNK_BNK_ISSUE_ISSUER_ASSESSMENT**). In this case, the unrated exposures are assigned a reference rating based on the reference issue available or the rating of the party, whichever is applicable. These unrated exposures are assigned a risk weight based on the reference rating.

For unrated Banking exposures, the application does an issue-issuer assessment to infer a rating of the unrated exposures, based on the rating of a similar instrument (referred to as reference issue hereafter) issued by the same issuer. The reference issue is used only when it is of the same currency as the exposure and the exposure is senior or equivalent to the same. For the unavailable reference issue, the party rating is used. In the case of the party also being unrated, the exposure remains unrated. Also, the application populates whether the exposure is LT rated or ST rated, based on the rating assigned to the exposure.

10.1.1.7.4   Risk Weight Assignment Rules

Banking Exposures Risk Weight

Risk Weight is assigned based on asset class and the credit rating as per Basel guidelines. The risk weight rules operate on the risk weight table (**FSI_RW_MAP_MASTER**). Highly rated exposures are allocated low-risk weight and poorly rated exposures are allocated high-risk weights. If exposure has more than one rating (rated by more than one agency), then the final rating is assigned based on multiple assessments. The application updates the risk weights against the exposures directly, when ratings are not considered.

Options for risk-weighting are selected during Run definition if the Run Management UI is used, to update the required calculations as allowed by the specific jurisdiction. For more details on the options, see the Run Management section.

Figure 75: Process Flow of Risk Weight Assessment

Risk weight assignment takes place in the sub-process: **BNK_RISK_WEIGHT_ASSIGNMENT_STD** in **Banking Data Processing – STD** process.

Risk Weight Assignment

Risk Weight is assigned on basis of asset class and the credit rating as per the CRR IV guidelines. The risk weight rules operate on the risk weight table (FSI_RW_MAP_MASTER). Highly rated exposures are allocated low risk weight and poorly rated exposures are allocated high risk weights. If an exposure has more than one rating (rated by more than one agency), then the final rating is assigned on the basis of multiple assessments. The application updates the risk weights against the exposures directly, when ratings are not considered. Options for risk weighting process are selected during Run definition if the Run Management UI is used. If the Run Rule Framework (RRF) of OFSAAI is used, a setup code from USR_DEFINED_RUN_PARAMETERS is set in the Rule EU - Run Definition User Defined Run Param Assignment.

The multiple assessment of ratings are performed in the Data Transformation "Mult_Assessment_SCP" for the sold credit protection exposures, since their risk weight is based on the securitization framework. And the multiple assessment of ratings for all other non securitzed exposures are performed in the Data Transformation "Mult_Assessment_NonSec".

The mutliple assessment for the Non Sec exposure happens in the sub process Multiple Assessment.

The multiple assessment for the Sold Credit protection exposure happens in the sub process Sold Credit Protection Exposure Data Population.

The details of the Data Transformation are as follows:

Data Transformation Name	Objective	Processing Logic
Mult_Assessment_NonSec	The objective of this Data Transformation is to perform multiple assessment of the ratings and assign a normalized rating and risk weight to the non-securitized exposures and the underlying exposures.	For each exposure, the various standard ratings associated with that exposure and the respective risk weights are identified. If the number of ratings are 1, then the same rating gets assigned as the standard rating for the exposure and the risk weight associated with that standard rating gets assigned as the Pre-mitigation risk weight. If the number of ratings are greater than or equal to 2, then the exposure is assigned a risk weight which is the worst of the best two risk weights. And the corresponding rating is assigned to the exposure. This also assigns the rating to the parties and the sovereigns, based on the multiple assessments.
Mult_Assessment_SCP	The objective of this Data Transformation is to perform multiple assessment of the ratings and assign a normalized rating and risk weight to the sold credit protection exposures.	For each exposure, the various standard ratings associated with that exposure and the respective risk weights are identified. If the number of ratings are 1, then the same rating gets assigned as the standard rating for the exposure and the risk weight associated with that standard rating gets assigned as the Pre-mitigation risk weight. If the number of ratings are greater than or equal to 2, then the exposure is assigned a risk weight which is the worst of the best two risk weight. And the corresponding rating is assigned to the exposure.

For more information on setting up this Rule, see Run Parameters Setup for Run Creation section.

Figure 76: Process Flow for Risk Weight Assignment

```
┌─────────────────────────────────────────────────────────────────┐
│                    Risk Weight Process START                      │
└─────────────────────────────────────────────────────────────────┘
                                │
                                ▼
┌─────────────────────────────────────────────────────────────────┐
│    Assign Risk Weights using exposure rating, party rating or     │
│                          sovereign rating                          │
└─────────────────────────────────────────────────────────────────┘
                                │
                                ▼
┌─────────────────────────────────────────────────────────────────┐
│        Assign Risk Weights and Ratings after multiple assessment   │
└─────────────────────────────────────────────────────────────────┘
                                │
                                ▼
┌─────────────────────────────────────────────────────────────────┐
│      Update Risk Weights and Ratings after issue vs issuer        │
│                            agreement                               │
└─────────────────────────────────────────────────────────────────┘
                                │
                                ▼
┌─────────────────────────────────────────────────────────────────┐
│  Assign Risk Weights directly to exposures without ratings for    │
│  Cash CRE, and so on. And also assign risk weights to unrated     │
│                           exposures                               │
└─────────────────────────────────────────────────────────────────┘
```
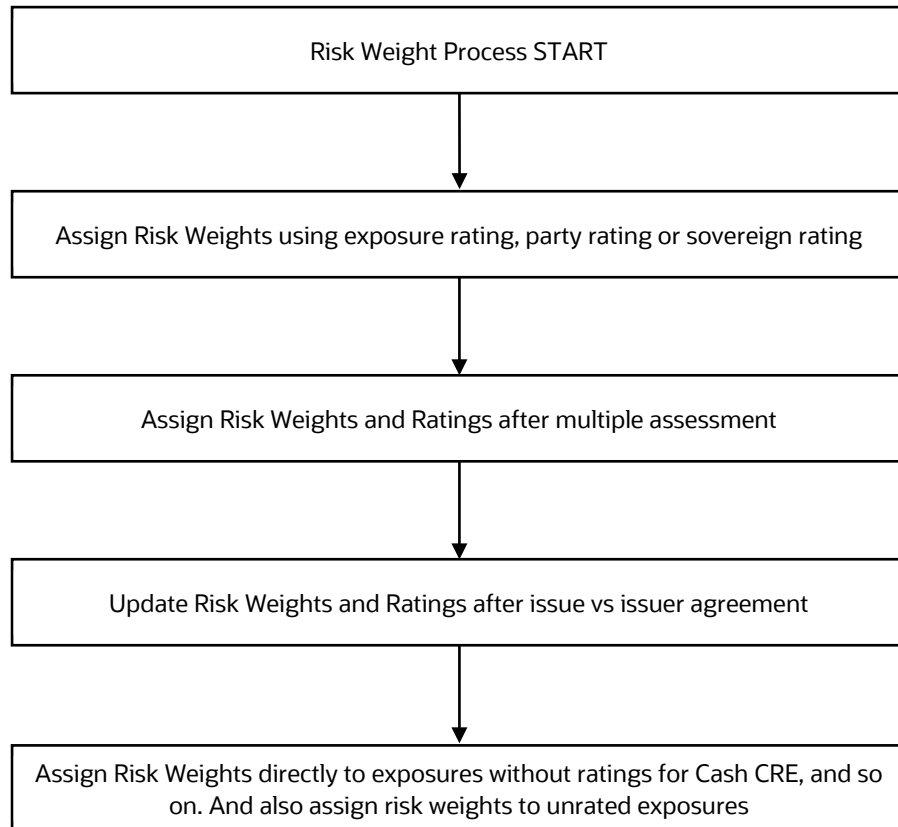
For exposures that are related to high risk, the solution reclassifies the assets or the products specified in the accord, and assigns them 150% Risk Weight. The solution reclassifies all the Basel products mentioned in the accord for the high risk treatment, with the High Risk Exposure Flag (**F_EXP_TREATED_AS_HIGH_RISK**) as Y, in the Non Sec processing table.

The Accord also mentions cases where a bank can have its own customized high risk category of exposures. To cater to this requirement, the bank has to create a custom rule for identifying those high risk exposures and populate this with the high risk exposure flag as Yes in Fact Non Sec Exposures table. This must be placed before the rule which is pertaining to the high risk exposure risk weight assignment based on discretion of the bank. These exposures are assigned 150% RW based on the rule EU - High Risk Exposure Risk Weight Assignment Based on Discretion of Bank.

For exposures that are based on a third country, and given the treatment on par with European Union, it is expected that the bank provides the country as EU approved third country jurisdiction in the country dimension (**DIM_COUNTRY**).

The Loan to value calculation for the Commercial Real Estate (CRE) and Residential Real Estate (RRE) product types and mitigant types are based on the bank opting for calculation using either mortgage lending value or market value. This is based on the bank's option, which is selected using the run management option, This is handled in the Loan To Value Ratio Calculation sub process.

The sub process Non Sec Risk Weight Assignment Processing, Risk Weight Assignment based on Asset Class handle this requirement for Risk weight assignment.

Pre-CRM RWA Computation

Pre-CRM RWA is calculated for all asset classes by multiplying the Pre-CRM EAD with the risk weight. RWA for Unexpected Loss is calculated as follows:

Non-Sec Pre-Mitigation Pre-Volatility Haircut Exposure at Default * Non-Sec Risk Weight for UL before Mitigation.

If reporting bank has an exposure to one of its own subsidiaries, then that exposure is classified as an internal transaction. A subsidiary is identified by the values present in **V_PARENT_CODE** in the **DIM_ORG_STRUCTURE** table.

Each of the internal transaction, that is, transaction between parent and its subsidiary is marked as a deduction line item, from the corresponding tiers of capital. For the internal transactions which are not regulatory capital calculations, the solution supports the risk weight of 0% to these exposures based on the supervisory approval. This is handled as part of the run management option.

All the internal transactions which are not part of the regulatory capital calculations are risk weighted at 0%, based on the supervisory approval. This option must be selected in the run management option.

The deduction is processed as part of capital structure in the capital structure processing and all the internal transactions are eliminated from any RWA calculation.

The covered bond and the CIU are processing specific to EU. The solution has undergone changes to cater to these functionalities.

10.1.1.7.5 RWA Calculations

The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight.

This is handled under the sub-process **BNK_PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_STD** in **Banking Data Processing – STD** process.

10.1.1.8 Credit Risk Mitigation Process

In order to calculate the post CRM RWA, application needs to account for mitigants which may be in the form of collaterals, guarantees, credit derivatives. Not all mitigants are eligible for RWA computation. All the mitigants which get populated into the system are being made ineligible, and then the regulatory approved mitigant types and the issuer type combination are made eligible.

10.1.1.8.1 Mitigant Processing

Mitigant Data population

Mitigant data is loaded from the Stage Mitigant table (STG_MITIGANTS) into the FSI CAP Mitigants table (FSI_CAP_MITIGANTS) where further processing takes place. This is takes place under the sub-process **Mitigant Data Population** under the process **Mitigant Data Processing.**

Mitigant Multiple assessment

Similar to exposures with multiple ratings, mitigants with multiple ratings are also subject to Multiple rating Assessment. This is handled under the sub-process **Mitigant Multiple Rating Assignment – BIS** under the process **Mitigant Data Processing -STD.**

The Data Transformation "CAP_MITIGANT_MULTIPLE_ASSESSMENT_DATA_POP" performs this.

10.1.1.8.2 Mitigant Approaches and their Risk Weighting Rules

Mitigant Risk Weight

For Simple approach, the application assigns risk weight to mitigants on the basis of credit rating (**CAP Mitigant Basel Rating and Risk Weight Assignment**), original maturity (**CAP Mitigant RW Assignment based on Original Maturity**) and for Nettable Liabilities (**CAP Mitigant RW Assignment for Nettable Liabilities**). These fall under the process **Mitigant RW Assignment – Simple –BIS**.

Similarly, for Comprehensive approach, mitigant risk weights are assigned on the basis of credit rating (**CAP Mitigant Basel Rating and Risk Weight Assignment**), for financial collaterals (**CAP Mitigant RW Assignment for Financial Collaterals - Comprehensive Approach**) and for nettable liabilities (**CAP Mitigant RW Assignment for Nettable Liabilities**). These fall under the process **Mitigant RW Assignment – BIS –Comprehensive Approach**.

Mitigant Eligibility

The application identifies the eligible mitigants based on the criteria as mentioned by the Regulator. The application identifies the following standard mitigants– collateral, guarantees, and credit derivatives.

The application is capable of using the Simple Approach and the Comprehensive Approach for the mitigants which are part of the collateral. The application identifies the eligibility of the financial collateral separately for the simple approach and the comprehensive approach. The eligibility of the collateral mitigants are based on the party type of the mitigant, mitigant types, the credit rating assigned to the mitigant or the party (as applicable), and the classification of collateral as senior or not.

For equity, the eligibility is based on the main index equity and the equity trading status. This is handled in CAP Mitigant Eligibility for Equity - Simple approach under the process **Mitigant Collateral Eligibility Simple Approach -BIS**.

For mutual funds, the eligibility is based on the eligible mutual fund indicator. This is handled in **CAP Mitigant Eligibility for Mutual Fund - Simple approach** under the process **Mitigant Collateral Eligibility Simple Approach -BIS**

The application also identifies whether the mitigant is a Re-securitized exposure and if yes, makes it ineligible.

This is handled in **CAP Collateral Eligibility - Simple Approach** under the process **Mitigant Collateral Eligibility Simple Approach -BIS**

The application identifies the eligibility of the guarantees and credit derivatives based on the party type of the mitigant and the credit rating assigned to the issuer of the mitigant. This is handled in **CAP Non Sec Mitigant Eligibility** under the process **Mitigant Collateral Eligibility Simple Approach –BIS.**

Similar mitigant eligibility rules for Comprehensive Rule can be found in the process **Mitigant Collateral Eligibility – Comprehensive Approach –BIS**

The option for the bank to select Collateral Simple Approach or Comprehensive Approach is based on the Run Management option as selected in the UI.

10.1.1.8.3 Mitigant Haircut Assignment

Under Standardized approach, the bank has to follow supervisory estimates for Mitigant Haircut assignment. This is based on the various categories like mitigant type, residual maturity, rating, issuer type and so on. This is applicable only if the bank follows comprehensive approach for collateral.

Only eligible mitigants are considered for haircut assignment and for further processing. Post haircut assignment, the eligible mitigants are moved from mitigants table (FSI_CAP_MITIGANTS) to sub exposures table (FSI_CAP_SUB_EXPOSURES).

The application does computations for three kinds of mitigant haircuts which are volatility haircut, FOREX haircut, and maturity mismatch haircut.

Volatility Haircut

Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. The application assign haircuts for various type of financial collateral like debt securities, equity, mutual funds, and so on. In the supervisory haircut method, the application assigns volatility haircut based on issues, issuer's ratings, mitigant's residual maturity, and type of mitigant.

This is handled in **CAP CRM Mitigant Volatility Haircut - Supervisory Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

Forex Haircut

If the exposure and collateral are in different currencies, then the application makes an adjustment by applying the FOREX haircut.

This is handled in **CAP CRM Forex Haircut Sub Exposures** under **CRM Sub Exposure Data Haircut Assignment** process.

Maturity Mismatch Haircut

If the residual maturity of the Credit Risk Mitigant is less than that of the underlying credit exposure, then a maturity mismatch haircut is applied to adjust the value.

This is handled under **CAP CRM Maturity Mismatch Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

10.1.2 Investment Portfolio

10.1.2.1 Rating Population

The data on ratings is captured in the following rating specific tables:

- Instrument Rating Table (**STG_INSTRUMENT_RATING_DETAILS**)

    - Ratings for investment exposures subject to credit risk (one that is in **STG_INVESTMENTS**) and mitigants are captured in this table.

- Party Rating Table (**STG_PARTY_RATING_DETAILS**)

    - Ratings for the customer are captured in this table.

- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)

    - Credit Rating for all countries is captured in this table.

- External Underlying Exposures Rating Table (**STG_EXT_ULY_ACCT_RATING_DTL**)

    - Credit Rating for all external underlying exposures is captured in this table. In the case of underlying exposures of CIU transactions, it is expected that the value of Exposure ID is that of the instrument ID to which the underlying exposures belong to. For example: If the Underlying Exposure ID EXP001, which belongs to the instrument INSTR001, and which has the parent ID as PARENT001; in this case, the data expected in this table is of the instrument INSTR001, with the Exposure ID as INSTR001.

10.1.2.2   Processing Steps

Banks obtain credit ratings from different sources and these are provided as an input in the application through the rating tables mentioned in the preceding list.

This is handled in the sub-process **RATING_RECLASSIFICATION_POPULATION** in **BIS Other Reclassifications** process.

The application re-classifies the rating information to BIS Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short Term ratings.

This is handled in the sub-process **Credit Rating Reclassification** in **BIS Other Reclassifications** process**.**

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables. Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

Ensure that the following columns are mandatorily populated with data in the **STG_PARTY_RATING_DETAILS** table: Rating source code (**V_RATING_SRC_CODE**), Party Code (**V_PARTY_CD**), Purpose (**V_PURPOSE**): In this field whether the rating is a domestic rating or foreign rating must be indicated. If any other rating is provided, then the exposure is considered as unrated. Data Population.

The following are the preprocessing steps:

Credit Risk exposures are updated in the application for all the product types through their respective input tables known as Product Processors. Main categories of Credit Risk Investment exposures, along with their respective table names that are used as an input, are as follows:

Product	Source Product Processor
Investment Products:	STG_INVESTMENTS
Money Market Instruments	STG_MM_CONTRACTS
Spot Forex Transactions	STG_FX_CONTRACTS
Fixed Assets	STG_FIXED_ASSETS

10.1.2.3   Data Population

There is a data population about the mitigants, which cater to all the types of mitigants like collateral, guarantee, and credit derivatives. There is one data population about the counter-guarantee for the guarantor.

Product	Source Product Processor
Mitigants – Collateral, Guarantee, Credit Derivatives	STG_MITIGANTS
Counter Guarantee	STG_MITIGANT_COUNTER_GUARANTEE

There is a data population about the mapping between the exposures and the mitigants.

Product	Source Table
Mapping for Exposures and Mitigants	STG_ACCOUNT_MITIGANT_MAP

In the case of investments in funds (CIUs), the underlying of the CIU is captured in either of the below tables, depending on the data availability

Product Type	Source Product Processor
Underlying composition Details of CIU	**STG_FUND_CIS_COMPOSITION**
Underlying Exposures of CIU	**STG_FUND_UNDERLYNG_COMPOSITION**

Processing table details

All Credit Risk Investment exposures are loaded into the table, FSI CAP Investment Exposures, **FSI_CAP_INVESTMENT_EXPOSURES** where further processing happens for this portfolio of exposures till the computation pertaining to Pre Credit Risk Mitigation process

This is handled in the process **Investment Data Population**.

10.1.2.4 Underlying Data Flow

The underlying exposures pertaining to these covered bonds are expected in the Underlying Exposure Staging table (**STG_UNDERLYING_EXPOSURES**), with the Instrument ID that of the Instrument, and the Underlying Data Type Identifier as "CB".

The underlying exposures pertaining to these CIU are expected in the Underlying Exposure Staging table (**STG_UNDERLYING_EXPOSURES**), with the Instrument ID that of the Insrument, and the Underlying Data Type Identifier as "CIU". The underlying composition of the CIU are expected in the Stage Fund Underlying Composition table (**STG_FUND_UNDERLYNG_COMPOSITION**). This has the underlying composition details of the fund, across various products, and the maximum permissible limit of investment in each of the product types, with the fund code as the Instrument ID.

The fund underlying composition and/or the underlying exposures are required for processing, only in the case of unrated CIUs. When the derivatives products are the underlying for a CIU, then the Notional amount of the derivative is expected to be given as the exposure amount in Stage Underlying Exposures (**STG_UNDERLYING_EXPOSURES**).

10.1.2.5 Shareholding Percent Multiplication

Shareholding percent multiplication for common entity level data is a part of **BIS Common Data Processing** (PMFCOM020) process. In this the application updates the shareholding percentage against each entity. The parent entity is updated with the value of 1 as the shareholding percent and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PERCENT).

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity with respect to parent entity against exposure amount, undrawn amount and provision amount for that exposure and update the same.

This is handled in the sub-process **INV_SHAREHOLDING_CALCULATION_STD** of the process Investment **Data Processing – STD**.

10.1.2.6 Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, the asset class for each exposure is arrived at. Similarly, the application does reclassification for mitigant based on its mitigant types and reclassifies it to standard mitigant types.

Ensure that all products and party type and mitigants which are bank-specific are reclassified, as part of the setup activity. If they are not reclassified, the treatment might not happen as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product types. For Example, Fixed Rate Bond is reclassified as Debt Securities

This is handled in the Basel Product Type Reclassification which is part of the COMMON_RECLASSIFICATION process.

Party Type Reclassification

Similar to the product type, the customer type (which are stored as counterparty type) are also reclassified as standard counterparty type. The customer information is expected in the Stage Party Master (STG_PARTY_MASTER), and this also includes the Party Type based on the Stage Party Type Master (STG_PARTY_TYPE_MASTER).

Party type reclassification Rules handle reclassification for customer types. For Example, housing finance company is reclassified as Corporate

This is handled in the Party Type Reclassification which is part of BIS Other Reclassification process.

Other Reclassification

As part of the reclassification rules, any other data which is being brought inside the application like seniority, transaction type and so on also get reclassified into OFSAA specific values. This is also mandatory to be done, as otherwise data will not be available for processing as required by the regulator.

This happens as part of the process COMMON_RECLASSIFICATION.

10.1.2.7 Asset Reclassification Rules

Based on Basel product type and standard counterparty type, an asset class is formed by the application. This asset class is used for data processing. The asset class is the same as specified in the accord.

For example, Standard counterparty is Corporate non-SME and Corporate SME, the asset class is corporate. For Basel product type gold, the asset class is Gold.

The asset class for all mitigants is reclassified based on their standard mitigant types and standard issuer type.

This happens in the sub-process **INV_RECLASSIFICATION_STD** of the process **Investment Data Processing - STD**.

10.1.2.8   Pre-mitigation Calculations

Based on the asset class, the application calculates the Pre-Credit Risk Mitigation (CRM) Exposure at Default (EAD) for each exposure. This value signifies the maximum loss that the bank can suffer, in case of default on this exposure, before considering any mitigation effects.

Some exposures can be hedged against credit risk through various mitigants such as guarantees, collaterals, credit derivatives, and so on. These provide mitigation to credit risk and must be considered while computing Credit RWA, as per the Accord. Hence, the application calculates the pre-mitigation exposure amount and post-mitigation exposure amount.

The application also computes pre-mitigation risk-weighted assets (Pre CRM RWA) and post-mitigation risk-weighted assets (Post CRM RWA) by multiplying the respective EAD by risk weight. The risk weight is arrived at, by considering the credit rating of the exposures and mitigants as per the guidelines.

10.1.2.8.1   Exposure at Default Amount Calculation

Pre CRM EAD

Exposure at Default (EAD) is calculated for all the products. This is being computed using the Exposure Amount (EOP Balance of the Exposure)

This happens in the process **INV_PRE_CRM_EAD_COMPUTATION_STD** of the process **Investment Data Processing - STD**.

Post CRM EAD

Through the CRM process, the bank considers the effect of the mitigation and calculates the post-mitigation exposure at the default amount. This signifies the maximum loss that the bank can suffer in case of default on this exposure, after considering the effects of the mitigation. This will be the EAD of the Exposure Pre-Mitigation less the covered portion of the mitigant

10.1.2.8.2   Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment process. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessment are first moved into the table FSI Mutliple Rating Processing (FSI_MULTIPLE_RATING_PROCESSING) wherein the ranking and final selection of which rating to use takes place.

This happens in the sub process of **INV_MULTIPLE_RATING_ASSESSMENT_DATA_POPULATION,** wherein the data for the multiple assessment processing gets populated into the FSI table. **MULTIPLE_RATING_ASSESSMENT,** wherein the identification of the multiple rating for the exposure happens, and the

INV_MULTIPLE_ASSESSMENT_BASED_RISK_WEIGHT_ASSIGNMENT wherein the actual risk weight and final rating assignment happens for the exposures.

All the above fall under **Investment Data Processing – STD**.

10.1.2.8.3   Issue Issuer Assessment

For all exposures which remain unrated after the multiple assessment processes, the issue issuer process is performed. This happens in the Issue Issuer Assessment sub-process (**INV_INV_ISSUE_ISSUER_ASSESSMENT**). In this case, the unrated exposures are assigned a reference rating based on the reference issue available or the rating of the party, whichever is applicable. These unrated exposures are assigned a risk weight based on the reference rating.

For unrated Non-Securitized exposures, the application does an issue-issuer assessment to infer a rating of the unrated exposures, based on the rating of a similar instrument (referred to as reference issue hereafter) issued by the same issuer. The reference issue is used only when it is of the same currency as the exposure and the exposure is senior or equivalent to the same. For the unavailable reference issue, the party rating is used. In the case of the party also being unrated, the exposure remains unrated. Also, the application populates whether the exposure is LT rated or ST rated, based on the rating assigned to the exposure.

10.1.2.8.4   Risk Weight Assignment Rules

Non-Sec Exposures Risk Weight

Risk Weight is assigned based on asset class and the credit rating as per Basel guidelines. The risk weight rules operate on the risk weight table (**FSI_RW_MAP_MASTER**). Highly rated exposures are allocated low-risk weight and poorly rated exposures are allocated high-risk weights.

If exposure has more than one rating (rated by more than one agency), then the final rating is assigned based on multiple assessments. The application updates the risk weights against the exposures directly, when ratings are not considered.

Options for risk-weighting are selected during Run definition if the Run Management UI is used, to update the required calculations as allowed by the specific jurisdiction. For more details on the options, see the [Run Management](#) section.

This is handled under the sub-process: **INV_RISK_WEIGHT_ASSIGNMENT_STD** in **Investment Data Processing – STD** process**.**

Funds/ Collective Investment Units

Equity Investments in Funds – (Collective Investment Units (CIU) Processing)

The CIU is funds that have invested in various exposures. The accord has specified various criteria for risk-weighting CIU exposures. The application supports all the approaches. In the case of CIU, the application follows a hierarchy of approaches:

- Look Through Approach

- Mandate Based Approach

- Fall Back Approach

The exposures to CIU are expected in the table Stage Investments (STG_INVESTMENTS), and the instrument code is expected to be populated for these exposures. The static information related to the instruments is expected in the Instrument contract dimension table (DIM_INSTRUMENT_CONTRACT), and the information about the instruments, which change periodically like the current outstanding issue amount, is expected in the Stage Instrument Contract Detail table (STG_INSTRUMENT_CONTRACT_DTL).

The underlying exposures of CIU are expected in **STG_FUND_CIS_COMPOSITION** with the fund code (instrument code) populated also into Parent Instrument Code.

The underlying composition of the CIU is expected in the table Stage Fund Underlying Composition (**STG_FUND_UNDERLYNG_COMPOSITION)**. This has the underlying composition details of the fund, across various products, and the maximum permissible limit of investment in each of the product types, with the fund code as the Instrument ID.

NOTE: The fund underlying composition and/or the underlying exposures are required for processing, only when the underlying of the fund is not available and when there is mandate information available for the fund.

When the derivatives products are underlying for a CIU, then the MTM value of the derivative is expected to be given as Asset MTM Value (N_ASSET_MTM_VALUE) in Stage Fund CIS Composition (STG_FUND_CIS_COMPOSITION). MTM value of the derivative must also be populated to Composition Value (N_COMPOSITION_VALUE).

	NOTE	Unless operational criteria are met, the look-through approach is not applicable.

Look Through Approach

The first approach in the hierarchy that application assigns based on the operational criteria given in the accord is LTA. To validate the operational criteria or conditions given, data is expected as input. Along with the suggested conditions application also checks for the availability of the underlying information. If all the sufficient information is available, the application assigns the Look Through Approach (LTA) and

computation will be followed as given in the accord. If operational criteria are not met, the application checks for the immediate next approach.

The look through approach are handled in the sub-process **CIU - INV – Risk Weight Method Assignment – Look Through Approach** in the process **INV_CIU_RISK_WEIGHT_METHOD_CALCULATION**.

Mandate Based Approach

This approach is applied when the information of the underlying and the third-party risk weights that can be used under the look-through approach are not available. To continue with this approach banks, need to have the mandate information required. Once the application checks for the information and assigns the approach, computations for MBA under the Standardized approach are in line with the Basel Accord.

This is handled in the sub-process **CIU - INV – Risk Weight Method Assignment – Mandate Based Approach** in the process **INV_CIU_RISK_WEIGHT_METHOD_CALCULATION**.

Fall Back Approach

If no approach from the hierarchy is applicable based on the checks performed, the application assigns Fall Back Approach. In this approach, all the exposures will be risk-weighted at 1250%.

This is handled in the sub-process **CIU - INV – Risk Weight Method Assignment – Fall Back Approach** in the process **INV_CIU_RISK_WEIGHT_METHOD_CALCULATION**.

Partial use of an approach

A bank may use a combination of the three approaches when determining the capital requirements for an equity investment in an individual fund, provided that the conditions for all the approaches are met.

This will be applicable only in the case of the treatment of funds in other funds, as within a fund the method cannot be different.

Treatment of funds invested in other funds

If the underlying information is available, then application checks for the approach that is used by the funds. If the approach is not same across then FBA will be assigned i.e. if the approach used for determining the RW of a fund and the same approach is also where it is invested. Further, if same then application carry on with the same approach (Look through or Mandate based approach respectively), if not then we will assign 1250% under Fall Back Approach.

Covered Bond Processing

The covered bonds are bonds which are backed by cash flows from an underlying asset. The covered bonds, as per the accord, undergoes preferential treatment of risk weighting if they satisfy few criteria. The solution validates the various criteria.

A high level process for the covered bond is as below:

Data Population to Account Level Processing Table
↓
Asset Reclassification
↓
Identification of the Qualification for Preferential Treatment
↓
Asset reclassification based on the Qualification for Preferential Treatment
↓
Risk Weight Assignment
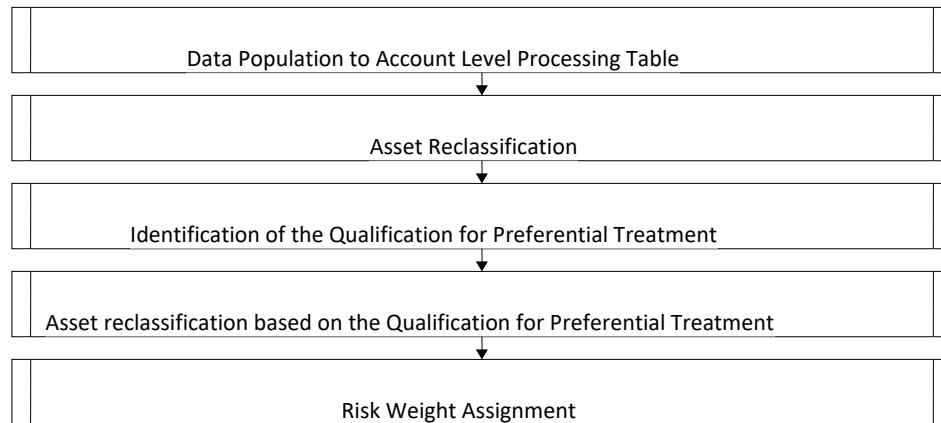
The exposures to the covered bond are expected in the Stage Investments table (**STG_INVESTMENTS**), and the instrument code is expected to be populated for these exposures.

The static information related to the instruments are expected in the Instrument contract dimension table (**DIM_INSTRUMENT_CONTRACT**), and the information pertaining to the instruments which changes periodically like the current outstanding issue amount is expected in the Stage Insrument Contract Detail table (**STG_INSTRUMENT_CONTRACT_DTL**).

The underlying exposures pertaining to these covered bonds are expected in the Underlying Exposure Staging table (**STG_UNDERLYING_EXPOSURES**), with the Instrument ID that of the Instrument, and the Underlying Data Type Identifier as "CB".

The covered bond underlying information are required only once for the instrument, regardless of the number of exposures to the instrument.

There are few critical information which are required for the processing of these covered bond instruments, which are captured in the instrument contract dimension table:

- Periodic Portfolio Information Received Flag

There are few critical information which are required for the processing of these covered bonds in the Stage Instrument Contract Detail table.

- Issued Current Outstanding Amount of the Instrument

- Issued Total Outstanding Amount of the Instrument

There are few critical information which are required for the processing of these covered bonds in the Stage Underlying Exposures table, if applicable.

- Senior Units of an Eligible Securitization

- Underlying Exposures' Loan To Income Ratio

- Underlying Exposures' Loan To Value Ratio

The underlying exposures are moved to the Non Sec Exposures processing table, and the instrument gets validated for the preferential treatment criteria. If the issue date is before 31-Dec-2007, the instrument and the related exposures are marked as eligible for preferential treatment.

If the issue date is after 31-Dec-2007, the solution checks the underlying exposures on the critieria mentioned in the accord and marks them as eligible or ineligible.

If all the underlying exposures meet the criteria, then, the exposure to the covered bond is marked as eligible for preferential treatment. Else, the exposure to the covered bond is treated as a normal exposure.

If the issue date is after 2007, and the underlying exposures are not provided, then, the covered bond gets treated as a normal exposure. The underlying of the covered bond gets moved out of the Non Sec processing table to another table FSI Underlying Audit Details (**FSI_UNDERLYING_AUDIT_DETAILS**).

Unless all information required for the covered bond preferential treatment eligibility check are populated into the application, the solution treats it as a normal exposure, which belongs to the asset class based on the issuer type.

The exposures to the covered bond, which meets the preferential treatment eligibility criteria, are reclassified into the Covered Bond asset class, and assigned the risk weight as per the preferential treatment. Else, it goes for normal risk weighting based on the standard party type related asset class.

The covered bond processing is handled in the sub process Risk Weight Assignment for Covered Bond.

Collective Investment Units (CIU) Processing

The CIU are funds which have invested in various exposures. The accord has specified various criteria for risk weighting the CIU Exposures. The solutions support all the approaches. In the case of CIU, the solution follows a hierarchy of approaches – High Risk Treatment, Treated of Rated CIU exposures, Treatment of Unrated CIU – Full Look Through Exposures, Treatment of Unrated CIU – Partial Look Through Exposures and Treatment of Unrated CIU – Other exposures

Data Population to Equity Exposure Processing Table
Asset Reclassification
Risk Weight Based on Supervisory Approval for High Risk Treatment
Risk Weigtht for Rated CIUs
Risk Weight for Unrated CIUs
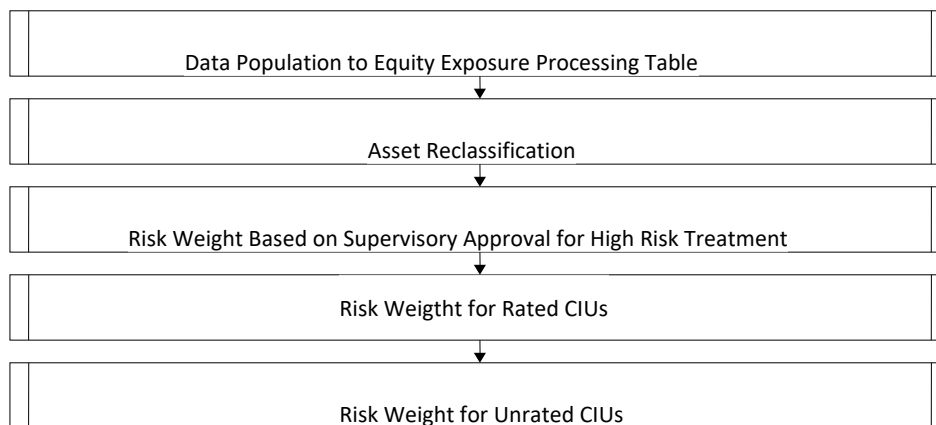
The exposures to the CIU are expected in the Stage Investments table (**STG_INVESTEMENTS**), and the instrument code is expected to be populated for these exposures. The static information related to the instruments are expected in the Instrument contract dimension table (**DIM_INSTRUMENT_CONTRACT**), and the information pertaining to the instruments which changes periodically like the current outstanding issue amount is expected in the Stage Insrument Contract Detail table (**STG_INSTRUMENT_CONTRACT_DTL**).

The underlying exposures pertaining to these CIU are expected in the Underlying Exposure Staging table (**STG_UNDERLYING_EXPOSURES**), with the Instrument ID that of the Insrument, and the Underlying Data Type Identifier as "CIU". The underlying composition of the CIU are expected in the Stage Fund Underlying Composition table (**STG_FUND_UNDERLYNG_COMPOSITION**). This has the underlying composition details of the fund, across various products, and the maximum permissible limit of investment in each of the product types, with the fund code as the Instrument ID.

The fund underlying composition and/or the underlying exposures are required for processing, only in the case of unrated CIUs. When the derivatives products are the underlying for a CIU, then the Notional

amount of the derivative is expected to be given as the exposure amount in Stage Underlying Exposures (**STG_UNDERLYING_EXPOSURES**).

The exposures are first assigned a risk weight of 150%, if the CIU is classified as a high risk, and the supervisor has provided approval to treat it under high risk. This supervisory approval is captured in the Supervisory Approval Table (**FSI_SETUP_ASSETS_SUP_APPR_INFO**). The CIUs are assigned the high risk category based on the risk return profile grade flag, which is captured in the instrument contract dimension table. The risk return profile grade is reclassified into the risk categories of low, medium and high. This is done using the reclassification rule "EU - Risk indicator assignment for CIU Instruments",, which can be updated based on the country specific risk criteria.

Unless the supervisory approval is populated, and the risk return profile grade is reclassified as high risk, the CIU is not treated as high risk item.

In the case of CIU having a rating, then, the CIU is risk weighted as per the CIU's rating. In the case of unrated CIUs, the solution follows look through apporach, provided the operational criteria are satisfied. The regulated party flag in the party table, and the periodic portfolio information received in the insturment contract table are required for this operational criteria check.

Unless operational criteria are met, the look through approaches are not applicable.

If the operational criteria are met, and the CIU invests in a depository institution, the risk weight can be provided as a input. This is handled in the rule "EU - CIU Risk Weight Assignment based on Third Party Issued Risk Weight"

If the operational criteria are met, and the underlying exposure data are available the CIU is treated under Full Look through approach, and the weighted average risk weight of the underlying exposures are assigned to the CIU exposure.

If the operational criteria are met, and the underlying exposure are not available the CIU is treated under Partial Look through approach. In this, the underlying exposures are created based on the maximum permissible limit, and the investment in financial instruments percentage of the fund underkying composition table. These exposures go for risk weight treatment under issuer asset class, based on the product type. The Exposure Amount of the underlying exposures are recomputed, based on the maximum underlying exposure percentage and the descending order of risk weights. The weighted average risk weight of the underlying exposures are assigned to the CIU exposure.

Any other unrated exposures are also assigned a risk weight of100%

In the case of Partial Look through, the rule "EU - Non Sec Pre-Mitigation RW for UL - PLT Approach" helps in overriding the risk weight calculated for the underlying exposures, based on the underlying asset class and the credit rating.

The entire processing of CIU happens in the sub process "CIU Risk weight Assignment".

The CRD Accord expects few exposures to be treated as high risk category, and be assigned a differential RW of 150%. All these high risk categories are identified by the solution and it populates the exposure treated as high risk indicator flag as Yes in the Fact Non Sec Exposures and Fact Equity Exposures tables. And the solution risk weights all the exposures with high risk indicator flag as Yes to 150%.

The Accord also mentions cases where a bank can have its own customized high risk category of exposures. To cater to this requirement, the bank has to create a custom rule for identifying those high risk exposures and populate this with the high risk indicator flag as Yes in Fact Non Sec Exposures table. This must be placed before the rule which is pertaining to the high risk exposure risk weight assignment based on discretion of the bank. These exposures are assigned 150% RW based on the rule EU - High Risk Exposure Risk Weight Assignment Based on Discretion of Bank.

10.1.2.8.5 RWA Calculations

The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight.

This is handled under the sub-process **INV_PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION_STD under the process Investment Data Processing – STD**.

10.1.2.9 Credit Risk Mitigation Process

In order to calculate the post CRM RWA, application needs to account for mitigants which may be in the form of collaterals, guarantees, credit derivatives. Not all mitigants are eligible for RWA computation. All the mitigants which get populated into the system are being made ineligible, and then the regulatory approved mitigant types and the issuer type combination are made eligible.

10.1.2.9.1 Mitigant Processing

Mitigant Data population

Mitigant data is loaded from the Stage Mitigant table (STG_MITIGANTS) into the FSI CAP Mitigants table (FSI_CAP_MITIGANTS) where further processing takes place. This is takes place under the sub-process **Mitigant Data Population** in the process **Mitigant Data Processing.**

Mitigant Multiple assessment

Similar to exposures with multiple ratings, mitigants with multiple ratings are also subject to Multiple rating Assessment. This is handled under the sub-process **Mitigant Multiple Rating Assignment – BIS** in the process **Mitigant Data Processing -STD.**

The Data Transformation "CAP_MITIGANT_MULTIPLE_ASSESSMENT_DATA_POP" performs this.

10.1.2.9.2 Mitigant Eligibility Approaches and their Risk Weighting Rules

Mitigant Risk Weight

For Simple approach, the application assigns risk weight to mitigants based on credit rating (**CAP Mitigant Basel Rating and Risk Weight Assignment**), original maturity (**CAP Mitigant RW Assignment based on Original Maturity**) and for Nettable Liabilities (**CAP Mitigant RW Assignment for Nettable Liabilities**). These fall under the process **Mitigant RW Assignment – Simple –BIS**.

Similarly, for Comprehensive approach, mitigant risk weights are assigned based on credit rating (**CAP Mitigant Basel Rating and Risk Weight Assignment**), for financial collaterals (**CAP Mitigant RW Assignment for Financial Collaterals - Comprehensive Approach**) and for nettable liabilities (**CAP Mitigant RW Assignment for Nettable Liabilities**). These fall under the process **Mitigant RW Assignment – BIS –Comprehensive Approach.**

Mitigant Eligibility

The application identifies the eligible mitigants based on the criteria as mentioned by the Regulator. The application identifies the following standard mitigants– collateral, guarantees, and credit derivatives.

The application can use the Simple Approach and the Comprehensive Approach for the mitigants which part of the collateral are. The application identifies the eligibility of the financial collateral separately for the simple approach and the comprehensive approach. The eligibility of the collateral mitigants are based on the party type of the mitigant, mitigant types, the credit rating assigned to the mitigant or the party (as applicable), and the classification of collateral as senior or not.

For equity, the eligibility is based on the main index equity and the equity trading status. This is handled in CAP Mitigant Eligibility for Equity - Simple approach under the process **Mitigant Collateral Eligibility Simple Approach -BIS**.

For mutual funds, the eligibility is based on the eligible mutual fund indicator. This is handled in **CAP Mitigant Eligibility for Mutual Fund - Simple approach** under the process **Mitigant Collateral Eligibility Simple Approach -BIS**

The application also identifies whether the mitigant is a Re-securitized exposure and if yes, makes it ineligible.

This is handled in **CAP Collateral Eligibility - Simple Approach** under the process **Mitigant Collateral Eligibility Simple Approach -BIS**

The application identifies the eligibility of the guarantees and credit derivatives based on the party type of the mitigant and the credit rating assigned to the issuer of the mitigant. This is handled in **CAP Non-Sec Mitigant Eligibility** under the process **Mitigant Collateral Eligibility Simple Approach –BIS.**

Similar mitigant eligibility rules for Comprehensive Rule can be found in the process **Mitigant Collateral Eligibility – Comprehensive Approach –BIS**.

The option for the bank to select Collateral Simple Approach or Comprehensive Approach is based on the Run Management option as selected in the UI.

10.1.2.9.3 Mitigant Haircut Assignment

Under Standardized approach, the bank must follow supervisory estimates for Mitigant Haircut assignment. This is based on the various categories like mitigant type, residual maturity, rating, issuer type and so on. This is applicable only if the bank follows comprehensive approach for collateral.

Only eligible mitigants are considered for haircut assignment and for further processing. Post haircut assignment, the eligible mitigants are moved from mitigants table (FSI_CAP_MITIGANTS) to sub exposures table (FSI_CAP_SUB_EXPOSURES).

The application does computations for three kinds of mitigant haircuts which are volatility haircut, FOREX haircut, and maturity mismatch haircut.

Volatility Haircut

Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. The application assign haircuts for various type of financial collateral like debt securities, equity, mutual funds, and so on. In the supervisory haircut method, the application assigns volatility haircut based on issues, issuer's ratings, mitigant's residual maturity, and type of mitigant.

This is handled in **CAP CRM Mitigant Volatility Haircut - Supervisory Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

Forex Haircut

If the exposure and collateral are in different currencies, then the application makes an adjustment by applying the FOREX haircut.

This is handled in **CAP CRM Forex Haircut Sub Exposures** under **CRM Sub Exposure Data Haircut Assignment** process.

Maturity Mismatch Haircut

If the residual maturity of the Credit Risk Mitigant is less than that of the underlying credit exposure, then a maturity mismatch haircut is applied to adjust the value.

This is handled under **CAP CRM Maturity Mismatch Haircut** under **CRM Sub Exposure Data Haircut Assignment** process.

10.2 Counterparty Credit RWA

Counterparty Credit RWA is the calculation of the counterparty credit risk exposures. This includes the derivative portfolio and the Securities and Financing transaction portfolio. This also includes the exposures in both banking book and trading book.

The counterparty credit exposures also undergo additional RWA calculation in the form of Credit Valuation Adjustment (CVA). The mark to market counterparty credit losses or the spread migration risk is captured with CVA, which was not directly capitalized before. CVA is the difference between the risk-free portfolio value and the true portfolio value that considers the possibility of the counterparty's default. In other words, CVA is the market value of counterparty credit risk.

10.2.1 Derivatives Portfolio

Figure 77: Process Flow for Derivatives Portfolio
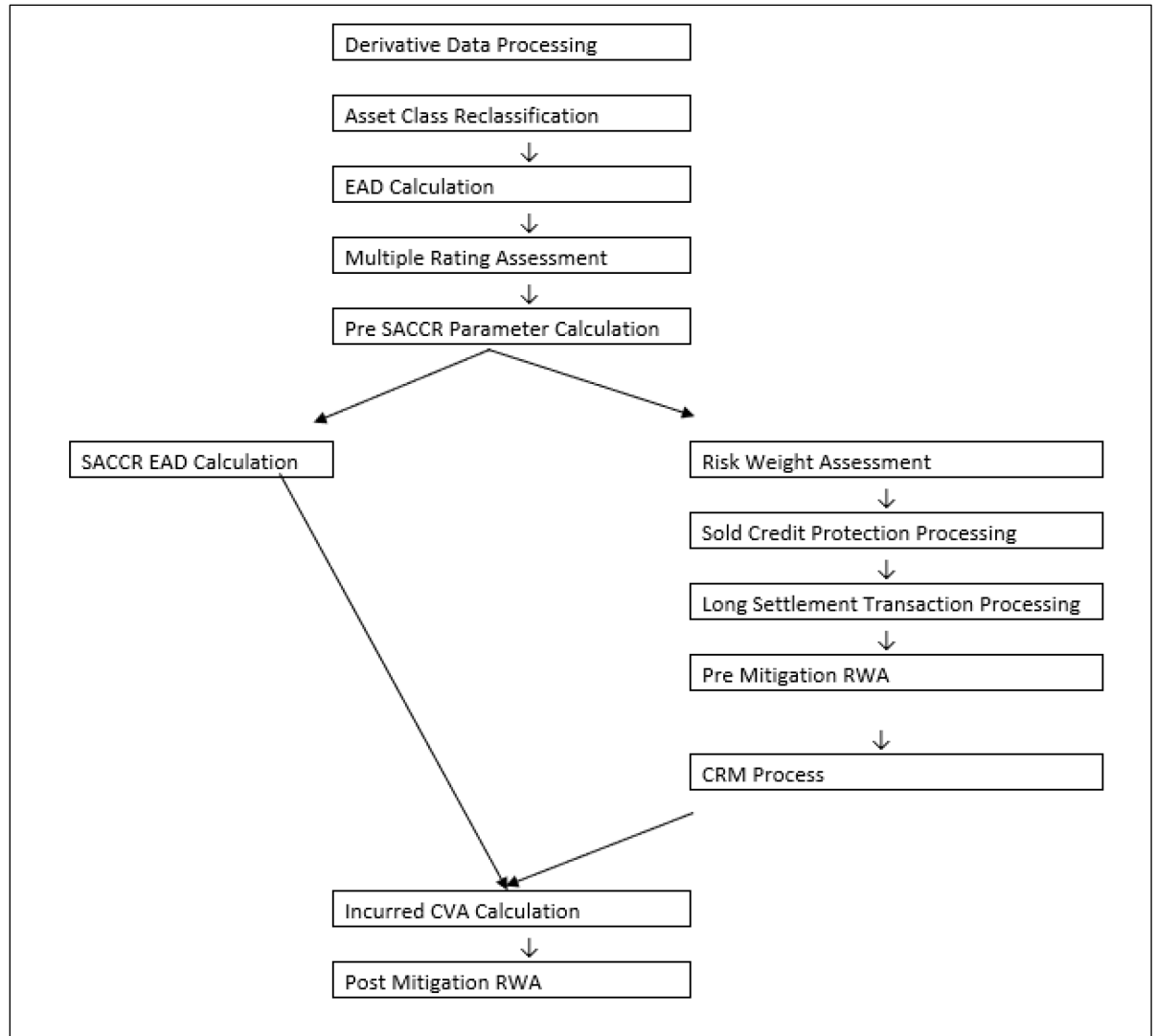
10.2.1.1 Rating Population

The Data on ratings is captured in the following rating specific tables:

- Party Rating Table (**STG_PARTY_RATING_DETAILS**)

  - Credit rating for all are captured in this table.

- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)

  - Credit Rating for all countries is captured in this table.

  - Instrument Rating Table (**STG_INSTRUMENT_RATING_DETAILS**)

Ratings for all instruments are captured in this table. Even the posted collateral (Placed Collateral) and received collateral (Mitigants) related ratings are captured in this table and this is handled in the process DRV_INSTRUMENT_RATING_POPULATION.

10.2.1.1.1   Processing Steps

Banks obtain credit ratings from different sources and these are provided as an input in the application through the rating tables mentioned in the preceding list.

This is handled in the process R**ATING_RECLASSIFICATION_POPULATION.**

The application re-classifies the rating information to EU Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short-Term ratings.

This is handled in the process C**redit Rating Reclassification**.

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables.

Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

Ensure that all the relevant columns as indicated in the DL Specs are mandatorily populated with data. For example, in the Stage Party Rating Details (**STG_PARTY_RATING_DETAILS)** table: Rating source code (**V_RATING_SRC_CODE**), Party Code (**V_PARTY_CD**), Purpose (**V_PURPOSE**) are required to be populated. The purpose code is to indicate whether the rating is a domestic rating or foreign rating. If any other rating is provided, then the exposure is considered as unrated.

10.2.1.2   Data Population

The following are the preprocessing steps:

Credit Risk exposures are updated in the application for all the product types through their respective input tables known as Product Processors. Main categories of Counterparty Credit Risk exposures, along with their respective table names that are used as an input, are as follows:

Product	Source Product Processor
Swaps	STG_SWAPS_CONTRACTS
Futures	STG_FUTURES
Options	STG_OPTION_CONTRACTS
Credit Derivatives	STG_CREDIT_DERIVATIVES
Forwards	STG_FORWARDS

There is a data population about the placed collateral and central counterparty details, which are required for the cleared transaction and default fund contribution treatment.

Product	Source Product Processor
Placed Collateral	STG_PLACED_COLLATERAL
Default Fund Contribution	STG_CCP_DETAILS

There is a data population about the mitigants, which cater to the applicable mitigant type like collateral received for the derivatives

Product	Source Product Processor
Mitigants – Collateral received	STG_MITIGANTS

There is a data population about the mapping between the exposures and the mitigants. And one data population about the mapping between the exposures and the placed collateral

Product	Source Table
Mapping for Exposures and Mitigants	STG_ACCOUNT_MITIGANT_MAP
Mapping for Exposures and Placed Collateral	STG_ACCT_PLACED_COLL_MAP

Processing table details

All Counterparty credit Risk related derivative exposures are loaded into the table, FSI Cap Derivative (**FSI_CAP_DERIVATIVES)** where further processing happens for this portfolio of exposures till they are moved to the Netting set granularity. This is handled in the process Derivative Data Population process, under sub process;

- DERIVATIVE_SWAPS_EXPOSURE_DATA_POPULATION

- DERIVATIVE_FUT_EXPOSURE_DATA_POPULATION

- DERIVATIVE_OPT_EXPOSURE_DATA_POPULATION

- DERIVATIVE_CREDIT_DERIVATIVES_DATA_POPULATION

All placed collateral that the bank has placed, which are not specific to Securities Financing Transactions exposures, are loaded into the table, FSI_ PLACED_COLLATERAL

All the collateral that the bank has received, as part of the Derivative transactions, are loaded into the table, FSI_CAP_MITIGANTS.

10.2.1.3 Shareholding Percent Multiplication

Shareholding percent multiplication for common entity level data is a part of **BIS Common Data Processing** (PMFCOM020) process. In this the application updates the shareholding percentage against each entity. The parent entity is updated with the value of 1 as the shareholding percent and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PERCENT).

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity with respect to parent entity against exposure amount, undrawn amount and provision amount for that exposure and update the same.

This is handled in the sub-process **DRV_SHAREHOLDING_CALCULATION_STD of the process DRV data processing**

10.2.1.4 Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, the asset class for each exposure is arrived at. Similarly, the

application does reclassification for mitigant based on its mitigant types and reclassifies it to standard mitigant types.

Ensure that all products and party type and mitigants which are bank-specific are reclassified, as part of the setup activity. If they are not reclassified, the treatment might not happen as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product types. For Example, Interest Rate Futures is reclassified as Futures

This is handled in the Basel Product Type Reclassification which is part of the BIS Other Reclassification process.

Party Type Reclassification

Similar to the product type, the customer type (which are stored as counterparty type) are also reclassified as standard counterparty type. The customer information is expected in the Stage Party Master (STG_PARTY_MASTER), and this also includes the Party Type based on the Stage Party Type Master (STG_PARTY_TYPE_MASTER).

Party type reclassification Rules handle reclassification for customer types. For Example, a Small business entity is reclassified as Corporate SME

This is handled in the Party Type Reclassification which is part COMMON_RECLASSIFICATION process.

Instrument Type Reclassification

Bank Instrument types used by the reporting bank as input data are reclassified to Instrument types. The instrument types after reclassification are stored as Instrument types. For Example, Interest Rate Future Contract is reclassified as Interest Rate Futures. This happens as part of the process COMMON_RECLASSIFICATION process.

Mitigant Reclassification

For mitigants the application reclassifies the mitigant type to the standard mitigant type like the debt securities.

The reclassification tasks are present in the MITIGANT_TYPE_RECLASSIFICATION.

10.2.1.5   Pre-mitigation Calculations - Exposure at Default Amount Calculation

Pre-mitigation Exposure at Default can be calculated using one of the two approaches of EAD – SA CCR and IMM methods. This is based on run management selection.

The Standardized Approach for Counterparty Credit Risk (SA-CCR) is an alternative for Standardized Method (SM) and Current Exposure Method (CEM) for Counterparty Credit Risk (CCR) in Credit Risk.

Banks can use the SA-CCR approach while they follow Standardized or IRB approaches for credit risk. The SA-CCR approach is applicable for Over the Counter (OTC) Derivatives, Exchange Traded Derivatives, and Long Settlement Transactions.

10.2.1.5.1 SA-CCR Method of EAD Computation

The exposures under the SA-CCR consist of two components: replacement cost (RC) and potential future exposure (PFE). The replacement cost is mostly related to the mark to market of the derivative contract, by considering the collateral and margin agreement as relevant. The potential future exposure consists of a multiplier that allows for the partial recognition of excess collateral and an aggregate add-on.

The following flowchart depicts the process flow of SA-CCR.

Figure 78: Process Flow for SA-CCR Method of EAD Computation

Netting Agreement

For instruments participating in netting set, the notability flag should be set as 'Y'. Instruments with the same agreement code are netted in the same netting set.

The application creates new records for netting agreement and then populates into the FSI Netting Agreement Details (FSI_NETTING_AGREEMENT_DETAILS) table. The netting agreements will be populated in the process NETTING_AGREEMENT_DETAILS_DATA_POP.

Margin Agreement

For both RC and PFE, if one of the netting agreements has multiple margin agreements, then this netting agreement should be divided into sub-netting agreements to align with the margin agreements. This is captured in RC_MARGINED_UNMARGINED_AGREEMENT process Placed Collateral & Mitigant – Eligibility Condition

The mitigant is identified as eligible are not based on the eligibility rules for CRM as mentioned in Basel III accord. Credit rating of the collateral is considered for all mitigants types issued by all party types, while deciding whether a mitigant is eligible for a particular exposure or not. Separate eligibility Rules exist for mitigants types like equity, mutual funds, or debt security, to perform these checks. For the remaining, a mitigant is marked as eligible only if its credit rating is better than the exposure to which it is providing protection and also if it is classified as senior in position. This is handled in the sub process - Mitigant Processing – STD Approach (FSI_CAP_MITIGANTS). Mitigant eligibility is also checked based on the original and residual maturity of the collateral. Collateral is classified as eligible only if its original maturity is more than a year and residual maturity is more than 3 months.

The placed collateral is captured in FSI Cap Placed Collateral (FSI_CAP_PLACED_COLLATERAL) and this also moves to FSI Cap Mitigants (FSI_CAP_MITIGANTS), wherein the placed collateral and the mitigants both undergo the same treatment. This is part of the process FSI_PLACED_COLLATERAL_DATA_POPULATION and FSI_CAP_MITIGANT_DATA_POPULATION.

Placed Collateral & Mitigant – Haircut Assignment

The application assigns three kinds of mitigant haircut, which are volatility haircut, FOREX haircut, and maturity mismatch haircut. Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. Separate Rules exist in the application for various types of financial collaterals like debt securities, equity, mutual funds, and so on. When the exposure and collateral are in different currencies, the application makes an adjustment by applying FOREX haircut. If the residual maturity of CRM is less than the underlying credit exposure, then a maturity mismatch is applied. If there is a maturity mismatch and CRM have an original maturity of more than a year, the maturity mismatch haircut is applied to adjust the value. The application assigns a volatility haircut using Supervisory Haircut method when standardized approach is selected.

This is part of the process   FSI_PLACED_COLLATERAL_DATA_POPULATION and FSI_CAP_MITIGANT_DATA_POPULATION

Replacement Cost

The Replacement Cost (RC) is computed differently for margined and unmargined netting agreements.

All the required attributes for replacement cost are populated from the FSI Cap Derivative Exposures (FSI_CAP_DERIVATIVES) Cap Mitigants (FSI_CAP_MITIGANTS) and FSI Placed Collateral (FSI_PLACED_COLLATERAL) to the table FSI_CAP_NETTABLE_POOL wherein the replacement cost (N_REPLACEMENT_COST) calculation happens. Since there are different calculations required for the replacement cost, depending on whether it is a margined transaction or not, and depending on whether the netting set contains only a single margin agreement or multiple margin agreements, it happens in the table FSI_MARGINED_EAD_CALC. This is handled in the RC_MARGINED_UNMARGINED_TRANSACTION process.

In the case of contracts covered by margin agreement, the Initial margin and the Variation margin are expected at the netting agreement level. The minimum transfer amount and threshold amount

are also expected at the netting agreement level and expected to be provided as an input in the Stage Net Exposures tables (STG_NET_EXPOSURES).

Methods of identifying various risk categories and risk drivers

For each exposure, the banks must identify the primary risk driver of the risk factors such as interest rate, foreign exchange, credit, equity, or commodity. This is crucial because the Add-on formula for each risk category is different and it depends on the nature of the risk factors. The risk categories can be identified by defining the primary risk factors of underlying exposures in the derivative contracts.

This is selected by the bank based on the Run Management UI.

- Sensitivities Based Method
- SA-CCR Based Method
  - o All the Add-ons are computed for the instrument, with respect to all material risk drivers as per the SA CCR calculation. Using this, the material risk categories are identified, as the one with the maximum absolute value of sensitivity multiplied by the risk weight. This gets handled in the process and the table.
- Fall Back Approach
  - o All the Add-ons are computed for the instrument, with respect to all risk drivers. And all the risk categories will be considered as the material risk driver. This gets handled in the process and the table.

Essentially, it will be one instrument that can be mapped to multiple risk categories, with one material risk driver identified for each risk category. And the resultant replacement cost will be summation of the add-on across all the material risk categories.

The data for Risk Drivers and Categories will be from tables,

- o FSI Cap Risk Category Master (FSI_CAP_RISK_CATEGORY_MASTER)
- o FSI Cap Risk Driver Master (FSI_CAP_RISK_DRIVER_MASTER)
- o FSI Cap Risk Driver Map Master (FSI_CAP_RISK_DRIVER_MAP_MASTER)
- o Parameter Calculations for Potential Future Exposure

The parameters to be considered for the Calculation of Potential Future Exposure, which is treated under the process PRE_POTENTIAL_FUTURE_RISK_PARAMETERS,

Multiplier

The multiplier in the PFE formula serves to reduce the add-on for over collateralization as in practice many banks hold excess collateral precisely to offset potential increases in exposure represented by the add-on.

Aggregate Add-on

The asset classes; interest rate, foreign exchange, credit, equity or commodity and a derivatives transaction is assigned to an asset class based on its primary risk driver. The add-ons for each asset class are simply aggregated.

Most derivative transactions have one primary risk driver, defined by its reference to underlying instrument.

Adjusted Notional

For interest rate and credit derivatives, the trade-level adjusted notional is the product of the trade notional amount, converted to the domestic currency, and the supervisory duration (SD).

Supervisory delta adjustments

These parameters are also defined at the trade level and are applied to the adjusted notional amounts to reflect the direction of the transaction. For derivatives that are not options, the value of this parameter is +1 for long (MTM increases when the value of the primary risk factor increases) or -1 for short (MTM decreases when the value of the primary risk factor increases).

Supervisory correlation parameters

These parameters only apply to the PFE add-on calculation for equity, credit and commodity derivatives. For these asset classes, the supervisory correlation parameters are derived from a single-factor model and specify the weight between systematic and idiosyncratic components.

Potential Future Exposure (PFE)

The Potential Future Exposure (PFE) is computed differently for each of the risk categories, and the final value is assigned to the netting set (stored at the FSI Cap Nettable Pool (FSI_CAP_NETTABLE_POOL).

PFE add-ons are calculated for each asset class within a netting set and then aggregated. Add-ons for an asset class require the use of hedging sets, which are transactions within a single netting set within which partial or full offsetting is recognized in the methodology.

For Interest rate derivatives a hedging set consists of all derivatives Hedging sets are further divided into maturity categories. Long and short positions in the same hedging set are permitted to fully offset each other within maturity categories; across maturity categories, partial offset is recognized.

For the calculation of PFE, it is required to adopt the unmargined methodology. This is because, one margin agreement applies to multiple netting agreements and collaterals are based on the netted MTM values of the derivative contracts.

This is handled in FSI_POTENTIAL_FUTURE_EXP_CALC.

Exposure at Default Calculations (EAD)

Through the CRM process, the bank takes into account the mitigation effect and calculates the post mitigation exposure at default amount. This signifies the maximum loss that the bank can suffer in case of default on this exposure, after considering all the mitigation effects. The application also computes pre-mitigation risk weighted assets in the process DRV_PRE_CRM_RISK_WEIGHTED_ASSET_CALCULATION and post mitigation risk weighted assets in the process DRV_POST_CRM_RISK_WEIGHTED_ASSET_CALCULATION by multiplying the respective EAD by risk weight. The risk weight in this case is arrived at by analyzing the credit rating of the exposures or mitigants.

The risk weight is arrived at by multiplying pre-mitigation capital charge with 12.5. Through the Credit Risk Mitigation, the bank considers the effects of mitigation. The application checks mitigant eligibility based on the Basel specifications and assigns a haircut to each mitigant based on their currency, residual maturity, and expected volatility in their market value.

10.2.1.5.2 EAD Calculation Methods - Revised Original Exposure Method

If you select OEM Method for OTC portfolio and has exposures other than Interest Rate, Foreign exchange, and Gold are ignored since no treatment is specified in the accord.

Any exposure in the portfolio, which does not comply with the OEM set of requirements, will not be risk weighted, and the EAD will not be computed for those exposures and these exposures will not be part of the RWA calculations as well, as EAD will be null. It is expected that the bank considers this, while creating the portfolio, and also selects the method appropriately.

The application calculates Exposure at default (EAD) using the following formula:

EAD = Notional Amount *Add on

Where, Add-on factor is derived based on the underlying, maturity of the contract, perfectly matched contract and Nettability flag. This formula remains the same for Netting and Non-Netting calculations.

Perfectly Matched Contract in Netting Set

The perfectly matched contracts are a set of contracts which have the same value date, same currency code, within the same netting agreement set, same product types, and with opposite risk positions (long and short). In the case of cross currency forex contracts, the currency code of one contract must equal the other currency code of the second contract and the other currency code must equal the currency code of the second contract. The application calculates the settlement amount of the perfectly matched contracts in the netting agreement as follows:

Settlement Amount = Sum (notional principal of all buy (long position) contracts) - Sum (notional principal of all sell (short position) contracts)

For the calculation of perfectly matched netting set, the parameters of value date and currency code have to be provided.

Such calculated amount is distributed among the contracts in the perfectly matching set. For this the notional principal of these contracts are pro rated as follows:

Notional Principal of Contract= (Settlement Amount)*(notional principal of contract / sum (notional principal in the perfectly matching contract Set))

After prorating of notional principal is done for the contract the EAD is calculated as:

EAD = Notional Principal * Add-on.

The Add-on percentages are different for the contracts part of the perfectly matched netting set, and the contracts which are not part of the perfectly matched netting set.

For the purpose of Add-on assignment, the user can select either residual maturity or original maturity for the Interest rate swaps, based on the run management option.

Add-on for perfectly matched netting set contracts.

Original Maturity	Interest Rate Contracts	Foreign Exchange Contracts
One Year or Less	0.35%	1.50%
More than one year but not more than two years	0.75%	3.75%
Additional Allowance for each additional year	0.75%	2.25%

Add-on for non perfectly matched netting set contracts.

Original Maturity	Interest Rate Contracts	Foreign Exchange Contracts
One Year or Less	0.5%	2%
More than one year but not more than two years	1%	5%
Additional Allowance for each additional year	1%	3%

Operational Requirement for OEM

OEM cannot be opted by banks which have the small trading book business. This is expected to be validated by the user, before selecting the run management option of OEM, as an operational requirement, as the trading book exposures are not captured in the solution.

The criteria to identify banks having small trading book business are as follows:

- The on-balance sheet and off-balance sheet trading book assets are less than 5% of the total assets of the entity and also EUR 15 million. That is, Total On-balance sheet and Off-balance sheet trading book assets < min (5% of the total assets of the entity, 15 million)

- These assets never exceed 6% of the total assets and EUR 20 million.

10.2.1.6 Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment process. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessment are first moved into the table FSI Multiple Rating Processing (**FSI_MULTIPLE_RATING_PROCESSING**) wherein the ranking and final selection of which rating to use takes place.

This happens in the sub process of **DRV_MULTIPLE_ASSESSMENT_PROCESSING_DATA_POP,** wherein the data for the multiple assessment processing gets populated into the FSI table. MULTIPLE_RATING_ASSESSMENT, wherein the identification of the multiple rating for the exposure happens, and the DRV_MULTIPLE_ASSESSMENT_BASED_RISK_WEIGHT wherein the actual risk weight and final rating assignment happens for the exposures.

10.2.1.7 Issue Issuer Assessment

For all the exposures which remain unrated after the multiple assessment processes, the issue issuer process is performed. This happens in the Issue Issuer Assessment sub-process (**DRV_ISSUE_ISSUER_ASSIGNMET**). In this case, the unrated exposures are assigned a reference rating based on the reference issue available or the rating of the party, whichever is applicable. These unrated exposures are assigned a risk weight based on the reference rating.

For Derivatives, the application does an issue-issuer assessment to infer a rating of the unrated exposures, based on the rating of a similar instrument (referred to as reference issue hereafter) issued by the same issuer. The reference issue is used only when it is of the same currency as the exposure and the exposure is senior or equivalent to the same. For the unavailable reference issue, the party rating is used.

In the case of the party also being unrated, the exposure remains unrated. Also, the application populates whether the exposure is LT rated or ST rated, based on the rating assigned to the exposure.

10.2.1.8 Risk Weight Assignment Rules

Risk Weight Assignment to all Exposures

Risk Weight is assigned based on asset class and the credit rating as per Basel guidelines. The risk weight rules operate on the risk weight table (**FSI_RW_MAP_MASTER**). Highly rated exposures are allocated low-risk weight and poorly rated exposures are allocated high-risk weights. If exposure has more than one rating (rated by more than one agency), then the final rating is assigned based on multiple assessments. The application updates the risk weights against the exposures directly, when ratings are not considered.

Options for risk-weighting are selected during Run definition if the Run Management UI is used, to update the required calculations as allowed by the specific jurisdiction. For more details on the options, please refer the Run Management section.

Figure 79: Process Flow for Risk Weight Assignment Rules

Risk weight assignment takes place in the sub-process: **DRV_RISK_WEIGHT_ASSIGNMENT_STD**.

Risk Weight Assignment to Sold Credit Protection Exposures

The sold credit protection data is specific to sold credit derivatives. This data is available in the product processor table STG_CREDIT_DERIVATIVES. The sold credit protection data is processed under **SOLID_PROTECTION_CREDIT_DATA_PROCESSING.** The underlying data are required for all the sold credit protection.

The risk weight assignment for the sold credit protection is based on the asset type of the underlying exposure captured in **Non-Sec Pre-Mitigation RW Assignment for Rated SCP - STD**

- The risk weight for the underlying exposure is calculated and this is updated to the sold credit protection exposure under the sub process **Derivative Pre-Mitigation RW UL for SCP based on Revised Sec Framework**

- The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight

- In the case of sold credit protection exposures, the Pre-Mitigation EAD and the Post Mitigation EAD are the same since there are no mitigants for these exposures.

The underlying data for sold credit protection data is provided in the STG_UNDERLYING_EXPOSURES table. The underlying for the sold credit protection have V_UNDERLYING_DATA_IDENTIFIER where the underlying of the sold credit protection have the "V_UNDERLYING_DATA_IDENTIFIER" as "SCP", to recognize this for the Sold credit protection treatment captured in sub process Derivative_SCP_underlying.

Risk Weight Assignment to Cleared Transaction Exposures

Where a bank acts as a clearing member of a CCP for its own purposes, a risk weight of 2% must be applied to the bank's trade exposure to the CCP in respect of OTC derivatives, exchange traded derivative transactions and SFTs. Where the clearing member offers clearing services to clients, the 2% risk weight also applies to the clearing member's trade exposure to the CCP that arises when the clearing member is obligated to reimburse the client for any losses suffered due to changes in the value of its transactions in the event that the CCP defaults. This captured in process DRV_RISK_WEIGHT_ASSIGNMENT in sub process Derivative Basel III - RW Assignment for Cleared Transactions - Exposures - Revised Approach.

Risk Weight Assignment to Specific Wrong Way Risk Exposures

Specific Wrong Way Risk: Wrong-way risk is defined as the risk that occurs when exposure to counterparty is adversely correlated with the credit quality of that counterparty. It arises when default risk and credit exposure increase together. For all the transactions which are identified as Specific wrong way risk, Risk weight is assigned in process DRV_RISK_WEIGHT_ASSIGNMENT.

10.2.1.9   RWA Calculations

The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight.

In the case of sold credit protection exposures, the Pre-Mitigation EAD and the Post-mitigation EAD is the same since there are no mitigants for these exposures.

10.2.1.10   Post CRM RWA Calculations

In the case of derivatives, there are no additional mitigants, and hence both pre-CRM RWA calculations and post CRM RWA calculations are one and the same.

10.2.1.11 Allocation of RWA at Exposures

CCR RWA calculated at the netting set level is allocated to the exposures of the nettable pool using the following formula:

RWA at Exposure Level = Total CCR RWA at netting set level * Pre-Mitigation EAD for Exposure / Sum of Pre-Mitigation EAD for all Exposures part of CCR RWA at netting set level

10.2.2 Securities Financing Transactions Portfolio

Securities Financing Transactions (SFT) include Repo Style transactions, Margin Lending, Security Financing Borrowing, and so on. Under Standardized method we have two approaches -1. Simple approach – this is the approach wherein the collateral is being substituted for the covered portion of the exposure, and the risk weights as applicable for the standard mitigant type and issuer type are assigned to the collateral. and 2. Comprehensive approach – this is the approach wherein the collateral undergoes haircut treatment and the exposure value gets reduced from this portion

For all SFT contracts which have a placed collateral or mitigant mapped to it, the application computes CRM based on the RWA approach undertaken by the bank.

Process Flow for Credit Risk Securities Financing Transactions

Figure 80: Process Flow for Credit Risk Securities Financing Transactions
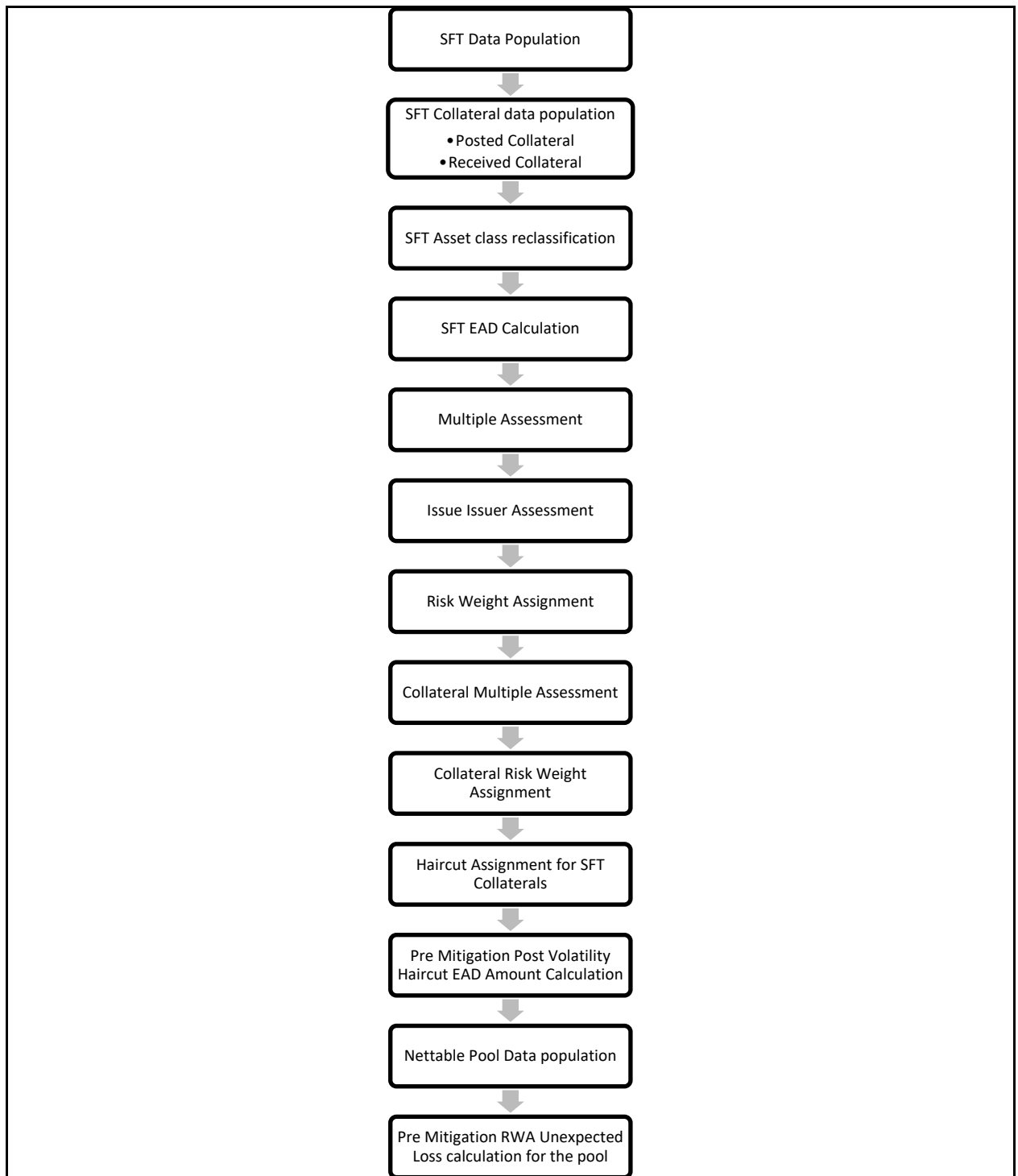
10.2.2.1 Rating Population

The data on ratings is captured in the following rating specific tables:

- Party Rating Table (**STG_PARTY_RATING_DETAILS**)
  - Credit Rating for all customers and issuers are captured in this table.

- Instrument Rating Table (STG_INSTRUMENT_RATING_DETAILS)

  - Credit Rating for all instruments which are in the form of collateral either placed or received, are captured in this table

- Sovereign Rating Table (**STG_SOVEREIGN_RATING_DETAILS**)

  - Credit Rating for all countries is captured in this table.

10.2.2.1.1 Processing Steps

Banks obtain credit ratings from different sources and these are provided as an input in the application through the rating tables mentioned in the preceding list.

This is handled in the process **RATING_RECLASSIFICATION_POPULATION.**

The application re-classifies the rating information to BIS Specific standard ratings. The out-of-box application supports the Fitch / Moodys / S&P and DBRS credit rating reclassification for Long Term and Short-Term ratings.

This is handled in the process **Credit Rating Reclassification**.

The rating reclassification lookup table (**FSI_RATING_CLASSIFICATION**) is used to lookup reclassified standard ratings so that the reclassification rule is not repeated for each of the rating processing tables.

Ratings are populated from the stage tables (for example, **STG_PARTY_RATING_DETAILS**) to FSI tables (for example, **FSI_PARTY_RATING_DETAILS**) using the lookup table (**FSI_RATING_CLASSIFICATION**) to obtain a reclassified rating.

Ensure that all the relevant columns as indicated in the DL Specs are mandatorily populated with data. For example, in the Stage Party Rating Details (**STG_PARTY_RATING_DETAILS)** table: Rating source code (**V_RATING_SRC_CODE**), Party Code (**V_PARTY_CD**), Purpose (**V_PURPOSE**) are required to be populated. The purpose code is to indicate whether the rating is a domestic rating or foreign rating. If any other rating is provided, then the exposure is considered as unrated.

10.2.2.2 Data Population

Credit Risk exposures are updated in the application for all the product types through their respective input tables known as Product Processors. Main categories of Counterparty Credit Risk exposures, along with their respective table names that are used as an input, are as follows:

Product	Source Product Processor
Margin Lending Transactions	STG_LOAN_CONTRACTS
Re purchase contracts	STG_REPO_CONTRACTS

There is a data population about the placed collateral that have been placed with respect to the SFT transaction.

Product	Source Product Processor
Placed Collateral	STG_PLACED_COLLATERAL

There is a data population about the mitigants, which cater to the mitigants that have been received with respect to the SFT transaction.

Product	Source Product Processor
Mitigants – Collateral Received	STG_MITIGANTS

There is a data population about the mapping between the exposures and the mitigants. And one data population about the mapping between the exposures and the placed collateral.

Product	Source Table
Mapping for Exposures and Mitigants	STG_ACCOUNT_MITIGANT_MAP
Mapping for Exposures and Placed Collateral	STG_ACCT_PLACED_COLL_MAP

Processing table details

All Counterparty Credit Risk SFT exposures are loaded into the table, FSI Cap SFT Exposures (**FSI_CAP_SFT_EXPOSURES)** where further processing happens for this portfolio of exposures.

This is handled in the process **SFT_Data_Population**.

10.2.2.3   Shareholding Percent Multiplication

Shareholding percent multiplication for common entity level data is a part of **BIS Common Data Processing** (PMFCOM020) process. In this the application updates the shareholding percentage against each entity. The parent entity is updated with the value of 1 as the shareholding percent and for each child entity, the percentage is based on the parent's holding percentage as specified for each child in fact entity shareholding percent table (FCT_ENTITY_SHR_HLD_PCT).

Shareholding percent multiplication for exposure level is part of each portfolio as well. In this process, the application multiplies the entity shareholding percentage for that entity with respect to parent entity against exposure amount, undrawn amount and provision amount for that exposure and update the same.

This process is handled in the sub process SFT_SHAREHOLDING_CALCULATION_STD of the process SFT_DATA_PROCESSING_STD.

10.2.2.4   Common Reclassification Rules

The application reclassifies the bank's product types and party types to standard product and party types. Based on the standard product and party type, the asset class for each exposure is arrived at. Similarly, the application does reclassification for mitigant based on its mitigant types and reclassifies it to standard mitigant types.

Ensure that all products and party type and mitigants which are bank-specific are reclassified, as part of the setup activity. If they are not reclassified, the treatment might not happen as expected by the regulator.

Product Type Reclassification

Product types used by the reporting bank as input data are reclassified to standard product types as recommended in the Accord. The product types after reclassification are stored as Basel product types. For Example, any security lending product is reclassified as Security lending and borrowing product type.

This is handled in the **Basel Product Type Reclassification** which is part of the COMMON_RECLASSIFICATION process.

Party Type Reclassification

Similar to the product type, the customer type (which are stored as counterparty type) are also reclassified as standard counterparty type. The customer information is expected in the Stage Party Master (STG_PARTY_MASTER), and this also includes the Party Type based on the Stage Party Type Master (STG_PARTY_TYPE_MASTER).

Party type reclassification Rules handle reclassification for customer types. For Example, any central bank is reclassified as Sovereign.

This is handled in the Party Type Reclassification which is part of BIS Other Reclassification process.

Mitigant Reclassification

For mitigants the application reclassifies the mitigant type to the standard mitigant type like the debt securities, cash, and so on.

The reclassification tasks are present in the MITIGANT_TYPE_RECLASSIFICATION.

Other Reclassification

As part of the reclassification rules, any other data which is being brought inside the application like seniority, transaction type and so on also get reclassified into OFSAA specific values. This is also mandatory to be done, as otherwise data will not be available for processing as required by the regulator.

This happens as part of the process COMMON_RECLASSIFICATION.

10.2.2.5 Asset Reclassification Rules

Based on Basel product type and standard counterparty type, an asset class is formed by the application. This asset class is used for data processing. The asset class is the same as specified in the accord.

For example, Standard counterparty is Corporate non-SME and Corporate SME, the asset class is corporate.

The asset class for all mitigants is reclassified based on their standard mitigant types and standard issuer type.

This happens in the sub process SFT_RECLASSIFICATION_STD and in the process SFT_DATA_PROCESSING_STD.

10.2.2.6 Pre-mitigation Calculations

Based on the asset class, the application calculates the Pre-Credit Risk Mitigation (CRM) Exposure at Default (EAD) for each exposure. This value signifies the maximum loss that the bank can suffer, in case of default on this exposure, before considering any mitigation effects.

In the case of SFT Exposures, the exposures are hedged against credit risk through various collateral. These collaterals provide mitigation to credit risk and must be considered while computing Credit RWA, as

per the Accord. Hence, the application calculates the pre-mitigation exposure amount and post-mitigation exposure amount.

The application also computes pre-mitigation risk-weighted assets (Pre CRM RWA) and post-mitigation risk-weighted assets (Post CRM RWA) by multiplying the respective EAD by risk weight. The risk weight is arrived at, by considering the credit rating of the exposures and mitigants as per the guidelines.

10.2.2.6.1 Exposure at Default Amount Calculation

Pre-mitigation Exposure at Default can be calculated using one of the two approaches of EAD – Simple Approach and Comprehensive Approach. This is based on run management selection.

Calculation of EAD – Comprehensive Approach

As per the Comprehensive Approach, the EAD is computed by considering the Exposure amount post haircut, and the collateral amount post haircut.

Exposure Amount Calculations for the Exposures

The exposure amount from the product processor tables STG_REPO_CONTRACTS and STG_LOAN_CONTRACTS for the respective products are based on their EOP balance i.e nothing but the End of period balance, which will be populated in to the processing table (FSI_CAP_SFT_EXPOSURES) for further calculations.

This is part of the process   SFT DATA POPULATION.

Placed Collateral & Mitigant – Eligibility

The mitigant is identified as eligible are not based on the eligibility rules for CRM as mentioned in Basel III accord. Credit rating of the collateral is considered for all mitigants types issued by all party types, while deciding whether a mitigant is eligible for a particular exposure or not. Separate eligibility Rules exist for mitigants types like equity, mutual funds, or debt security, to perform these checks. For the remaining, a mitigant is marked as eligible only if its credit rating is better than the exposure to which it is providing protection and also if it is classified as senior in position.

This is handled in the sub process - Mitigant Processing – STD Approach (FSI_CAP_MITIGANTS). Mitigant eligibility is also checked based on the original and residual maturity of the collateral. Collateral is classified as eligible only if its original maturity is more than a year and residual maturity is more than 3 months.

The placed collateral is captured in FSI Cap Placed Collateral (FSI_CAP_PLACED_COLLATERAL) and this also moves to FSI Cap Mitigants (FSI_CAP_MITIGANTS), wherein the placed collateral and the mitigants both undergo the same treatment.

This is part of the sub process Mitigant Processing – STD Approach – BIS in the process   SFT_PLACED_COLLATERAL_DATA_PROCESSING_STD.

Placed Collateral & Mitigant – Haircut Assignment

The application assigns three kinds of mitigant haircut, which are volatility haircut, FOREX haircut, and maturity mismatch haircut.

Volatility haircuts are assigned to the collateral to account for any future fluctuations in the market value of the financial collateral. Separate Rules exist in the application for various types of financial collaterals like debt securities, equity, mutual funds, and so on. The application

assigns a volatility haircut using Supervisory Haircut method when standardized approach is selected.

When the exposure and collateral are in different currencies, the application makes an adjustment by applying FOREX haircut.

If the residual maturity of CRM is less than the underlying credit exposure, then a maturity mismatch is applied. If there is a maturity mismatch and CRM have an original maturity of more than a year, the maturity mismatch haircut is applied to adjust the value.

This is part of the sub process SFT_COMPREHENSIVE_APPROACH_HAIRCUT_in the process   SFT_PLACED_COLLATERAL_DATA_PROCESSING_STDEAD Calculation for Exposures that are not part of netting agreement

For SFT transaction, the application calculates EAD for the parent exposure, based on the underlying information. The underlying exposures (which are the mitigants received and the collateral placed) are moved to **FSI_SFT_UNDERLYING** table from **FSI_CAP_MITIGANTS. FOREX** haircut is applied if the underlying and the parent contract are in a different currency. Each SFT underlying exposure adjusted for a haircut (EAD + haircut value) is added as EAD to the parent contract.

This is part of the process SFT_EXP_AND_PLACED_COLLATERAL_PROCESSING_STD.

EAD Calculation for Exposures that are part of netting agreement

The application nets SFT contracts based on the same customer, common netting agreement identifier, the transaction of Repo, Re-Repo or Margin Lending, Trading or Banking book, and so on. Margin lending transaction being SFT also follows the same EAD calculation methodology, however Repo or Reverse Repo and margin lending are not netted together.

The calculation happens in the table FSI Cap Nettable pool (FSI_CAP_NETTABLE_POOL). This is handled in the process SFT_NETTING_CALCULATION.

Calculation of EAD – Simple Approach

As per the Simple Approach, the EAD is computed by considering the Exposure amount and the mitigants assigned being sent under Credit Risk Mitigation process and assigning based on the Risk Weight of the Mitigants and the Exposures.

Exposure Amount Calculations for the Exposures

The exposure amount from the product processor tables STG_REPO_CONTRACTS and STG_LOAN_CONTRACTS for the respective products are based on their EOP balance i.e nothing but the End of period balance which will be populated in to the processing table (FSI_CAP_SFT_EXPOSURES) for further calculations. **This is part of the process   SFT DATA POPULATION.**

Placed Collateral & Mitigant – Eligibility

The mitigant is identified as eligible are not based on the eligibility rules for CRM as mentioned in Basel III accord. Credit rating of the collateral is considered for all mitigants types issued by all party types, while deciding whether a mitigant is eligible for a particular exposure or not. Separate eligibility Rules exist for mitigants types like equity, mutual funds, or debt security, to perform these checks. For the remaining, a mitigant is marked as eligible only if its credit rating is better than the exposure to which it is providing protection and also if it is classified as senior in position.

This is handled in the sub process - Mitigant Processing – STD Approach (FSI_CAP_MITIGANTS). Mitigant eligibility is also checked based on the original and residual maturity of the collateral. Collateral is classified as eligible only if its original maturity is more than a year and residual maturity is more than 3 months.

The placed collateral is captured in FSI Cap Placed Collateral (FSI_CAP_PLACED_COLLATERAL) and this also moves to FSI Cap Mitigants (FSI_CAP_MITIGANTS), wherein the placed collateral and the mitigants both undergo the same treatment. This is part of the sub process Mitigant Processing – STD Approach – BIS in the process SFT_PLACED_COLLATERAL_DATA_PROCESSING_STD.

Placed Collateral & Mitigant – Risk Weight Assignment

For Simple approach, the application assigns risk weight to mitigants on the basis of credit rating (CAP Mitigant Basel Rating and Risk Weight Assignment), and original maturity (CAP Mitigant RW Assignment based on Original Maturity). These fall under the process Mitigant RW Assignment – Simple –BIS.

This is part of the sub process Mitigant Processing – STD Approach – BIS in the process   SFT_PLACED_COLLATERAL_DATA_PROCESSING_STD

EAD Calculation for Exposures that are not part of netting agreement

For SFT transaction, the application calculates EAD for the parent exposure, based on the underlying information.

The underlying exposures (which are the mitigants received and the collateral placed) are moved to **FSI_SFT_UNDERLYING** table from **FSI_CAP_MITIGANTS.**

This is part of the process SFT_EXP_AND_PLACED_COLLATERAL_PROCESSING_STD The SFT exposures EAD by considering the collateral placed and received are handled as part of the credit risk mitigation process. This is in the PMF process CRM Data Processing.

EAD Calculation for Exposures that are part of netting agreement

The application nets SFT contracts based on the same customer, common netting agreement identifier, the transaction of Repo, Re-Repo or Margin Lending, Trading or Banking book, and so on. Margin lending transaction being SFT also follows the same EAD calculation methodology, however Repo or Reverse Repo and margin lending are not netted together.

The netted exposure of the SFT gets computed without the effects of the collateral received and placed in the FSI Cap Nettable Pool (FSI_CAP_NETTABLE_POOL). This gets handled in the process SFT_NETTING_CALCULATION.

The SFT exposures EAD by considering the collateral placed and received are handled as part of the credit risk mitigation process. This is in the PMF process CRM Data Processing.

10.2.2.6.2   Risk Weight Assignment

Multiple Assessment

For exposures with multiple ratings, risk weight assignment is based on multiple assessment process. For each exposure, the final rating is the worst of the best two ratings assigned to the exposure.

The risk weight corresponding to this rating is then assigned to the exposure.

Exposures for multiple rating assessment are first moved into the table FSI Multiple Rating Processing (FSI_MULTIPLE_RATING_PROCESSING) wherein the ranking and final selection of which rating to use takes place.

Below are the related sub-processes:

SFT_MULTIPLE_ASSESSMENT_PROCESSING_DATA_POP, wherein the data for the multiple assessment processing gets populated into the FSI table.

MULTIPLE_RATING_ASSESSMENT, wherein the identification of the multiple rating for the exposure happens, and the

SFT_MULTIPLE_ASSESSMENT_BASEL_RISK_WEIGHT_ASSIGNMENT, wherein the actual risk weight and final rating assignment happens for the exposures.

Issue Issuer Assessment

For all the exposures which remain unrated after the multiple assessment processes, the issue issuer process is performed. This happens in the Issue Issuer Assessment sub-process

(SFT_ISSUE_ISSUER_ASSESSMENT)

In this case, the unrated exposures are assigned a reference rating based on the reference issue available or the rating of the party, whichever is applicable. These unrated exposures are assigned a risk weight based on the reference rating.

For unrated exposures, the application does an issue-issuer assessment to infer a rating of the unrated exposures, based on the rating of a similar instrument (referred to as reference issue hereafter) issued by the same issuer. The reference issue is used only when it is of the same currency as the exposure and the exposure is senior or equivalent to the same. For the unavailable reference issue, the party rating is used. In the case of the party also being unrated, the exposure remains unrated. Also, the application populates whether the exposure is LT rated or ST rated, based on the rating assigned to the exposure.

Risk Weight Assignment

Risk Weight is assigned based on asset class and the credit rating as per Basel guidelines. The risk weight rules operate on the risk weight table (**FSI_RW_MAP_MASTER**). Highly rated exposures are allocated low-risk weight and poorly rated exposures are allocated high-risk weights. If exposure has more than one rating (rated by more than one agency), then the final rating is assigned based on multiple assessments. The application updates the risk weights against the exposures directly, when ratings are not considered.

Options for risk-weighting are selected during Run definition if the Run Management UI is used, to update the required calculations as allowed by the specific jurisdiction. For more information on the options, see the Run Management section.

Risk Weight Assignment happens in the process "SFT_RISK_WEIGHT_ASSIGNMENT STD"" for the SFT Exposures.

Figure 81: Process Flow for Risk Weight Assignment

10.2.2.6.3 RWA Calculations

The RWA is calculated as the Pre-mitigation EAD multiplied by the Pre-Mitigation Risk Weight.

10.2.2.7 Credit Risk Mitigation Process

In order to calculate the post CRM RWA, application needs to account for mitigants which may be in the form of collaterals (for simple approach) or guarantees that are being provided by the bank. All the mitigants which get populated into the system are being made ineligible, and then the regulatory approved mitigant types and the issuer type combination are made eligible.

10.2.3 Pooling and Optimizer

10.2.3.1 Pooling

Pooling is one of the pre-requisites for the optimized allocation of the exposures.

Pooling pulls out an exposure, and identifies all the relevant mitigants mapped to it, and the corresponding exposures mapped to these mitigants, and again the corresponding newer mitigants mapped to these exposures. This pooling assigns the cardinality to the exposures based on the mitigant combination.

This happens in the FSI Cap Sub Exposures (FSI_CAP_SUB_EXPOSURES), and the pooling is part of the sub process

The relevant cardinalities that get assigned to the exposures, as part of this pooling process are as follows:

- 1-0➜One exposure not mapped to any mitigant

- 1-1 ➜One exposure mapped to one mitigant

- 1-N➜One exposure mapped to multiple mitigants

- N-1 ➜Multiple exposures mapped to a single mitigant

- N-N ➜Multiple exposures mapped to Multiple mitigants

10.2.3.2 Optimizer

The optimizer is the process of allocation of the mitigants to the exposures, based on the different logic applicable for the various granularity. The details of this is available in the Annexure.

Both Pooling and Optimizer is handled under the process **CRM Sub Exposure Pooling and Optimizer Processing.**

10.2.3.3 Post CRM RWA

The application computes the covered amount and the uncovered amount for the exposures. The covered amount is computed by multiplying the covered factor with the exposure amount. To this covered amount, the application assigns the mitigant risk weight. The product of the covered amount and the mitigant risk weight is the covered RWA. The uncovered amount is computed by multiplying the uncovered factor (which is 1 – the sum of all covered factors for that exposure) with the exposure amount. This uncovered amount is multiplied by the exposure risk weight to get the uncovered RWA. The sum of the covered RWA and the uncovered RWA is the Post CRM RWA of the Exposure.

Figure 82: Process Flow for Post CRM RWA

Post-CRM RWA = Covered Amount * Risk Weight of the Mitigant
+ Uncovered Amount * Risk Weight of the Exposure

This is handled in the process Post CRM Expected and Unexpected Loss RWA Assignment

10.3   Default Fund Contributions Related Capital Charge

A default fund contribution refers to the funds contributed, or commitments made by a clearing member to a Central Counterparty's (CCP) equalized loss-sharing agreement. The purpose of such default funds is to provide capital, in addition to the collateral posted by participants and in addition to capital provided by the clearinghouse, as a safeguard against extraordinary losses that might occur in connection with.

For example, a financial crisis in the market or the simultaneous defaults of several large members. The clearing members contribute to such default funds kept with the central counterparty (clearing house) in the proportion of their exposure to the central counterparty.

The default fund contributions by the clearing members contribute toward the central counterparty's regulatory capital along with CCP's contributions to the default fund. These contributions act as collaterals to mutually share in the losses incurred by the clearing members due to counterparty defaults.

For each clearing member, a contribution is made to the central counterparty's default fund.

This contribution acts as a reliefs against the defaults by any clearing member of the central counterparty.

CRR IV explains the methods that the banking organization playing the part of a clearing member of the CCP, must adopt and compute risk-weighted assets (RWA) for a non-qualifying and a qualifying CCP.

The application handles the treatment of exposures to a QCCP and a Non-QCCP. This qualified CCP flag is expected to be provided as a download in the Party Master (**STG_PARTY_MASTER**) table.

If the CCP is a qualified CCP (QCCP), then the RWA amount is computed using one of the following two approaches stated below. Both are handled in the same Sub process - RWA For Default Fund Contribution With QCCP. This is based on the run management option selected.

- Own funds requirements for pre-funded contributions to the default fund of a QCCP.
- Alternative calculation of own funds requirement for exposures to a QCCP.

The approach to use of either the own fund requirements for QCCP or the alternative approach of the own fund requirements for QCCP is based on the run management option.

Approach 1

For the purpose of computing the clearing member's capital requirement, which is the reporting bank's capital requirement for the contributions made to the CCP's default fund, the hypothetical capital requirement of the central counterparty for the default fund must be known. This must be computed by the central counterparty based on the exposures of all the clearing members to the default fund. After this figure is calculated by the CCP, it is shared with all the clearing members to enable them and to compute their respective capital requirements against the default fund.

When the reporting bank gets the hypothetical capital requirement from the QCCP, next step is to compute the capital requirement of the reporting bank by finding out the proportion of the reporting bank's contribution in the total default fund contribution.

- The parameters considered for this purpose include the following QCCPs:
- Net potential exposure to the two largest clearing members,
- The total net potential exposure to all the clearing members,
- Total default fund contribution by all the clearing members,
- QCCP's own contribution to the default fund, and
- The total number of clearing members for the default fund.

The last step is to compute the risk weighted assets of the reporting bank corresponding to the default fund contribution to the QCCP by using the capital computed in the previous step.

These steps and the calculation involved are the following:

Step 1:

It requires the QCCP to calculate its hypothetical capital requirement (KCCP) for the default fund. This is done by the QCCP and is published to the clearing members for them to use for their respective capital calculations.

Step 2:

Compare KCCP with the funded portion of the default fund of a QCCP and calculate the capital requirement of the bank (KCM) by using the total of all the clearing members' capital requirements (K*CM). This capital requirement is considered on the contribution that the clearing members make to the default fund of the QCCP.

Approach 2

Capital Charge for the default fund contribution is calculated as follows:

Capital charge (Ki) = 8% * minimum (2% of Trade exposures to the QCCP + 1250% * default fund contribution to the QCCP, 20% * Trade Exposure Amount to the QCCP).

The solution also supports the treatment of a CCP stopping to calculate its own fund requirement to the CCP. The flag to indicate that the CCP has stopped calculating the own fund requirement is captured in the party table (**STG_PARTY_MASTER**). And based on the supervisory approval provided, in the run management option, the capital wil be calculated using the Alternative approach. Else, it is treated as a normal Credit Risk Exposure, part of the Corporate Asset class.

The flag to indicate that the CCP has stopped calculating the capital requirement is expected as part of the Party Master Table (**STG_PARTY_MASTER**). In the case of this flag being null, it is expected that the CCP is calculating the Total Capital and normal processing of QCCP or Non-QCCP happens.

Key Data Elements

Key data elements to be noted are listed in this section. To view the complete list of tables used, see the Download Specification document in MOS.

- Default fund contributions and related data are expected at Default fund – Central Counterparty level in the entity Stage Central Counterparty Details (STG_CCP_DETAILS).

- Hypothetical Capital Requirement of CCP, Maximum Net Potential Exposure of clearing member of CCP, 2nd Maximum Net Potential Exposure of clearing member of CCP, Total Net Potential Exposure of clearing member of CCP, Number of Clearing Members to the CCP, Total funded Default Fund Contribution of all clearing members to the CCP, Total unfunded Default Fund Contribution of all clearing members to the CCP and Default fund contribution of CCP from its own funds for each central counterparty level required.

- Application supports only the capital requirement of the bank (KCM) based on Funded/Unfunded default contributions from all clearing members not by Initial Margin. But data model supports place holders to capture Total Initial Margin by all clearing members to CCP and Bank's initial margin posted to CCP.

10.3.1 Capital Charge for Non-QCCP

If the CCP is not qualified (Non-QCCP), then the risk-weighted asset amount for the banking organization's default fund contribution is calculated using the Own fund's requirements for pre-funded contributions to the default fund of a non-qualifying CCP approach, as suggested in the accord.

10.3.2 Capital Charge for QCCP

If the CCP is a qualified CCP (QCCP), then the RWA amount is computed using one of the following two approaches stated below. Both are handled in the same Sub-process - RWA For Default Fund Contribution With QCCP. This is based on the run management option selected.

- Own funds requirements for pre-funded contributions to the default fund of a QCCP.

- An alternative calculation of own funds requirement for exposures to a QCCP.

The approach to the use of either the own fund requirements for QCCP or the alternative approach of the own fund requirements for QCCP is based on the run management option.

Approach 1

To compute the clearing member's capital requirement, which is the reporting bank's capital requirement for the contributions made to the CCP's default fund, the hypothetical capital requirement of the central counterparty for the default fund must be known. This must be computed by the central counterparty based on the exposures of all the clearing members to the default fund. After this figure is calculated by the CCP, it is shared with all the clearing members to enable them and to compute their respective capital requirements against the default fund.

When the reporting bank gets the hypothetical capital requirement from the QCCP, the next step is to compute the capital requirement of the reporting bank by finding out the proportion of the reporting bank's contribution in the total default fund contribution.

- The parameters considered for this purpose include the following QCCPs:

- Net potential exposure to the two largest clearing members,

- The total net potential exposure to all the clearing members,

- Total default fund contribution by all the clearing members,

- QCCP's contribution to the default fund, and

- The total number of clearing members for the default fund.

The last step is to compute the risk-weighted assets of the reporting bank corresponding to the default fund contribution to the QCCP by using the capital computed in the previous step.

These steps and the calculation involved are the following:

Step 1:

It requires the QCCP to calculate its hypothetical capital requirement (KCCP) for the default fund. This is done by the QCCP and is published to the clearing members for them to use for their respective capital calculations.

Step 2:

Compare KCCP with the funded portion of the default fund of a QCCP and calculate the capital requirement of the bank (KCM) by using the total of all the clearing members' capital requirements (K*CM). This capital requirement is considered on the contribution that the clearing members make to the default fund of the QCCP.

Approach 2

Capital Charge for the default fund contribution is calculated as follows:

Capital charge (Ki) = 8% * minimum (2% of Trade exposures to the QCCP + 1250% * default fund contribution to the QCCP, 20% * Trade Exposure Amount to the QCCP).

The application also supports the treatment of a CCP stopping to calculate its fund requirement to the CCP. The flag to indicate that the CCP has stopped calculating the own fund requirement is captured in the party table (**STG_PARTY_MASTER**). And based on the supervisory approval provided, in the run management option, the capital will be calculated using the Alternative approach. Else, it is treated as a normal Credit Risk Exposure, part of the Corporate Asset class.

The flag to indicate that the CCP has stopped calculating the capital requirement is expected as part of the Party Master Table (**STG_PARTY_MASTER**). In the case of this flag being null, it is expected that the CCP is calculating the Total Capital and normal processing of QCCP or Non-QCCP happens.

Key Data Elements

Key data elements to be noted are listed in this section. To view the complete list of tables used, see the Download Specification document in [MOS](#).

- Default fund contributions and related data are expected at the Default fund – Central Counterparty level in the entity Stage Central Counterparty Details (STG_CCP_DETAILS).

- Hypothetical Capital Requirement of CCP, Maximum Net Potential Exposure of clearing member of CCP, 2nd Maximum Net Potential Exposure of clearing member of CCP, Total Net Potential Exposure of clearing member of CCP, Number of Clearing Members to the CCP, Total funded Default Fund Contribution of all clearing members to the CCP, Total unfunded Default Fund Contribution of all clearing members to the CCP and Default fund contribution of CCP from its funds for each central counterparty level required.

- The application supports only the capital requirement of the bank (KCM) based on Funded/Unfunded default contributions from all clearing members not by Initial Margin. But the data model supports place holders to capture Total Initial Margin by all clearing members to CCP and Bank's initial margin posted to CCP.

10.4 Underlying Exposures Treatment Related to CIU, Securitization and Covered Bond

UNDERLYING FLOW

Underlying Flow Related to Securitization

The application also supports Underlying exposures that are received as input through Stage Underlying Exposures table (**STG_UNDERLYING_EXPOSURES**). This is relevant for the securitization exposures,

Banking Underlying Exposures

For these exposures, the parent exposures are securitization exposures, mapped via the securitization pool, but the underlying are Banking exposures.

In such cases, exposures will have a record type as **INV_NON_SEC_ULY** (Investment Underlying) and will be populated and processed in the Banking table FSI_CAP_BANKING_EXPOSURES. This is handled in the process **Bank Underlying Data Processing –STD.**

Investment Underlying Exposures

For these exposures, the parent exposures as well as the underlying exposures are both investment exposures. Such exposures will have record type as **INV_NON_SEC_ULY** (Investment Underlying) and will be populated and processed in the Investments table, FSI_CAP_INVESTMENT_EXPOSURES.

This is handled in the similar way as a normal investment exposure in the process **Investment Data Processing – STD**.

Underlying Flow Related to CIU

The application also supports Underlying exposures that are received as input through Stage Fund Underlying Composition table (**STG_FUND_UNDERLYNG_COMPOSITION**). This is relevant for the CIU exposures, the application also supports the underlying composition received as input through the Stage Fund CIS Composition table (STG_FUND_CIS_COMPOSITION)

Investment Underlying Exposures

For these exposures, the parent exposures as well as the underlying exposures are both investment exposures. Such exposures will have record type as **INV_NON_SEC_ULY** (Investment Underlying) and will be populated and processed in the Investments table, FSI_CAP_INVESTMENT_EXPOSURES.

Derivatives Underlying Exposures

For these exposures, the parent exposures are investment exposures, but the underlying are Derivatives exposures. Such exposures will have record type as **INV_NON_SEC_ULY** (Investment Underlying) and will be populated and processed in the Derivatives table FSI_CAP_DERIVATIVES.

This is handled in the process **Derivatives Underlying Data Processing -STD**.

10.5   Operational Risk Portfolio

Operational risk is a risk of loss resulting from inadequate or failed internal processes, people and systems, or external events". External Losses can occur due to Misappropriation of Assets, Tax Evasion, Theft of information, hacking damage or Third party theft or forgery. The Capital Adequacy guidelines prescribed by BIS has prescribed three methods for calculating Operational Risk capital charges and banks can use any of these methods to calculate capital charge:

Figure 83: Process Flow for Operational Risk Portfolio
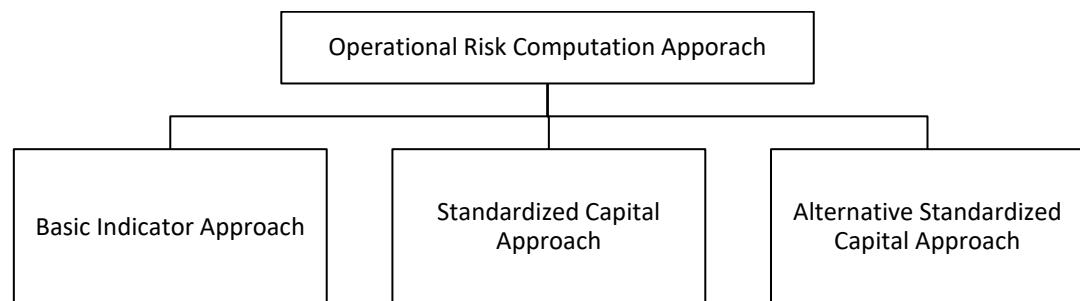
When executing Solo Run for computing Operational Risk, the parent entity data is processed. However, for a Consolidated Run the parent entity and the subsidiary data are processed.

Process Flow for Operation Risk RWA

Figure 84: Process Flow for Operation Risk RWA

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┌─────────────────────────────────────────────────────────┐
│              Operational Risk Data Population             │
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                             ⇩
┌─────────────────────────────────────────────────────────┐
│        OR Internal LoB to Standard LoB Reclassification   │
└─────────────────────────────────────────────────────────┘
                             ⇩
┌─────────────────────────────────────────────────────────┐
│              OR Basel Methodology Assignment              │
└─────────────────────────────────────────────────────────┘
                             ⇩
┌─────────────────────────────────────────────────────────┐
│             OR Annual Gross Income Calculation            │
└─────────────────────────────────────────────────────────┘
                             ⇩
┌─────────────────────────────────────────────────────────┐
│                  OR Beta Factor Calculation               │
└─────────────────────────────────────────────────────────┘
                             ⇩
┌─────────────────────────────────────────────────────────┐
│      Operational Risk Entity Capital Charge Computation   │
└─────────────────────────────────────────────────────────┘
                             ⇩
┌─────────────────────────────────────────────────────────┐
│ Operational Risk Line of Business Capital Charge Computation │
└─────────────────────────────────────────────────────────┘
                             ⇩
┌─────────────────────────────────────────────────────────┐
│                 Operational RWA Calculation               │
└─────────────────────────────────────────────────────────┘
                             ⇩
┌─────────────────────────────────────────────────────────┐
│              Operation RISK SUMMARY POPULATION            │
└─────────────────────────────────────────────────────────┘
```
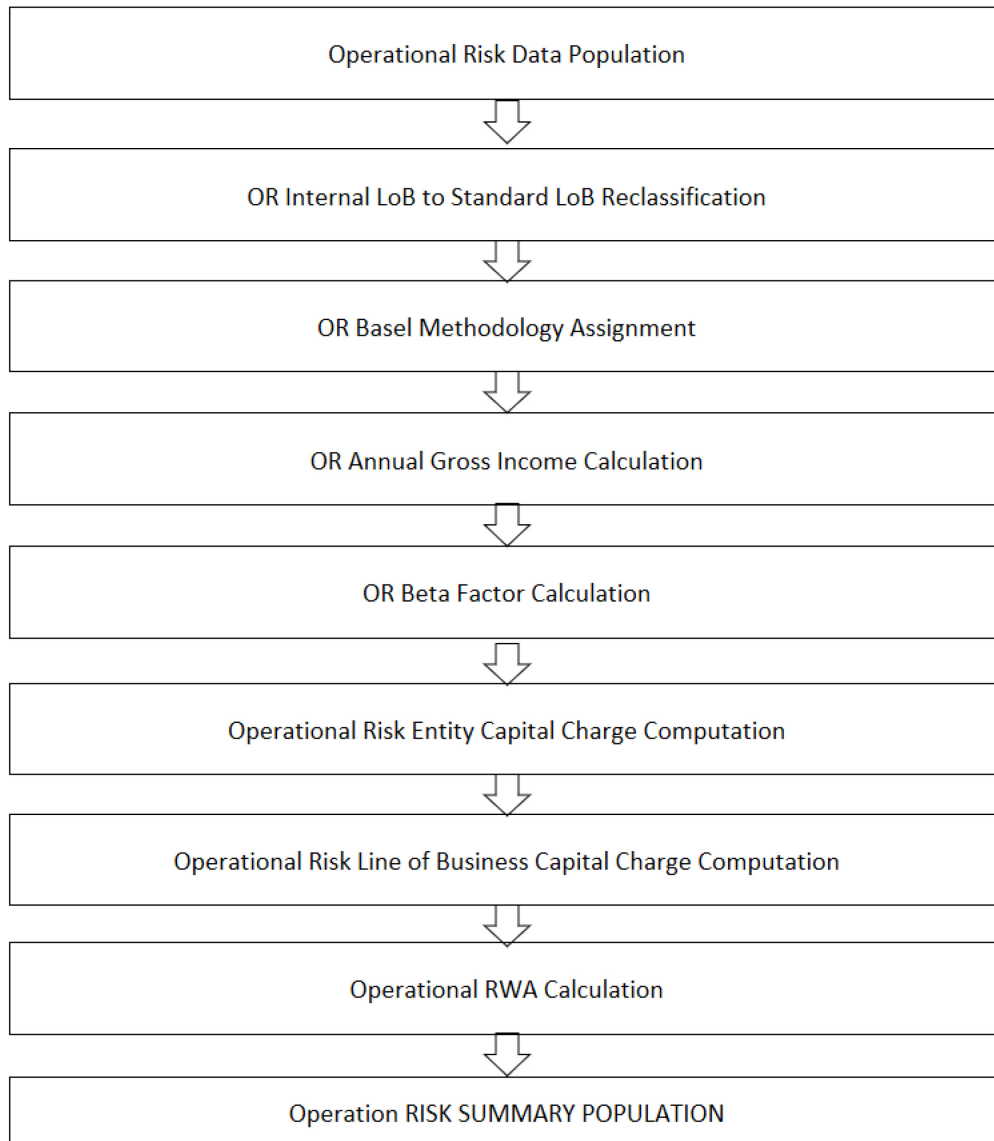
10.5.1   Data Population

The data required for the Operational Risk RWA calculations are part of the Stage Operational Risk Data (STG_OPS_RISK_DATA). This is the entity level information for various operational attributes related to the entities and the Lines of business.

All the other data related to entities, as detailed in the Capital Structure and Common section will have to be provided, to help in the identification of whether the entities are part of consolidation or not.

This is handled in the rule OPS_RISK_DATA_POPULATION

10.5.2   Shareholding Percent Multiplication

For all the entities, which are part of regulatory consolidation and parent shareholding percentage is required is getting updates the shareholding percentage against each entity data. These details are

captured in the Stage Entity Shareholding Details (STG_ENTITY_SHR_HLD_PERCENT) table. And using the shareholding percentage applicable for the entity, based on the solo or consolidation level, all the amount columns are multiplied by the corresponding shareholding percent.

This is handled in the Rules:

- OR Operating Income and Expense shareholding Percent Multiplication

- Shareholding Percent Multiplication of Balance sheet Attribute for Operational Risk

- OR Non Operating Income and Expense shareholding Percent Multiplication

- OR Other Income and Expense shareholding Percent Multiplication

- OR Other Income and Expense shareholding Percent Multiplication

10.5.3 Reclassification Rules

In the case of Operational Risk, the key reclassification rules are with respect to the entity type, which is based on the party type reclassification as detailed in the Credit risk section. The other relevant reclassification rules are the ones for the LOB Reclassification.

10.5.3.1 Line of Business Reclassification

- The internal lines of business, as maintained by the bank, are reclassified into Basel standard lines of business, as provided by the regulator for calculation of the operational risk..

- This is handled in the rule OR Internal LoB to Standard LoB Reclassification

10.5.4 Capital Charge Approaches

As part of the approaches suggested by the regulator for Operational Risk, the bank can follow one of the approaches, based on the supervisory approval, and bank meeting the operational requirements to comply with these guidelines.

- Basic Indicator Approach

- Standardized Approach

- Alternative Standardized Approach

10.5.4.1 Basic Indicator Approach

10.5.4.1.1 Capital Charge Calculation

Capital charge is calculated by multiplying the alpha value with the annual gross income of each year across each standard line of business. The average of 3 years is considered by the application, in sync with the regulatory ask.If the values of all the 3 years are not positive, then zero or the negative value from numerator and denominator is excluded.

In this approach, the alpha value is a fixed value set by the regulator.

This is handled in the rules Opr_Risk_Capital_Charge

10.5.4.1.2 Risk-Weight Asset Calculation

The capital charge value obtained is converted to the equivalent RWA value by multiplying with the factor of 12.5.

Operational Risk-Basic Indicator Approach - Data Population

Figure 85: Process Flow for Operational Risk-Basic Indicator Approach - Data Population
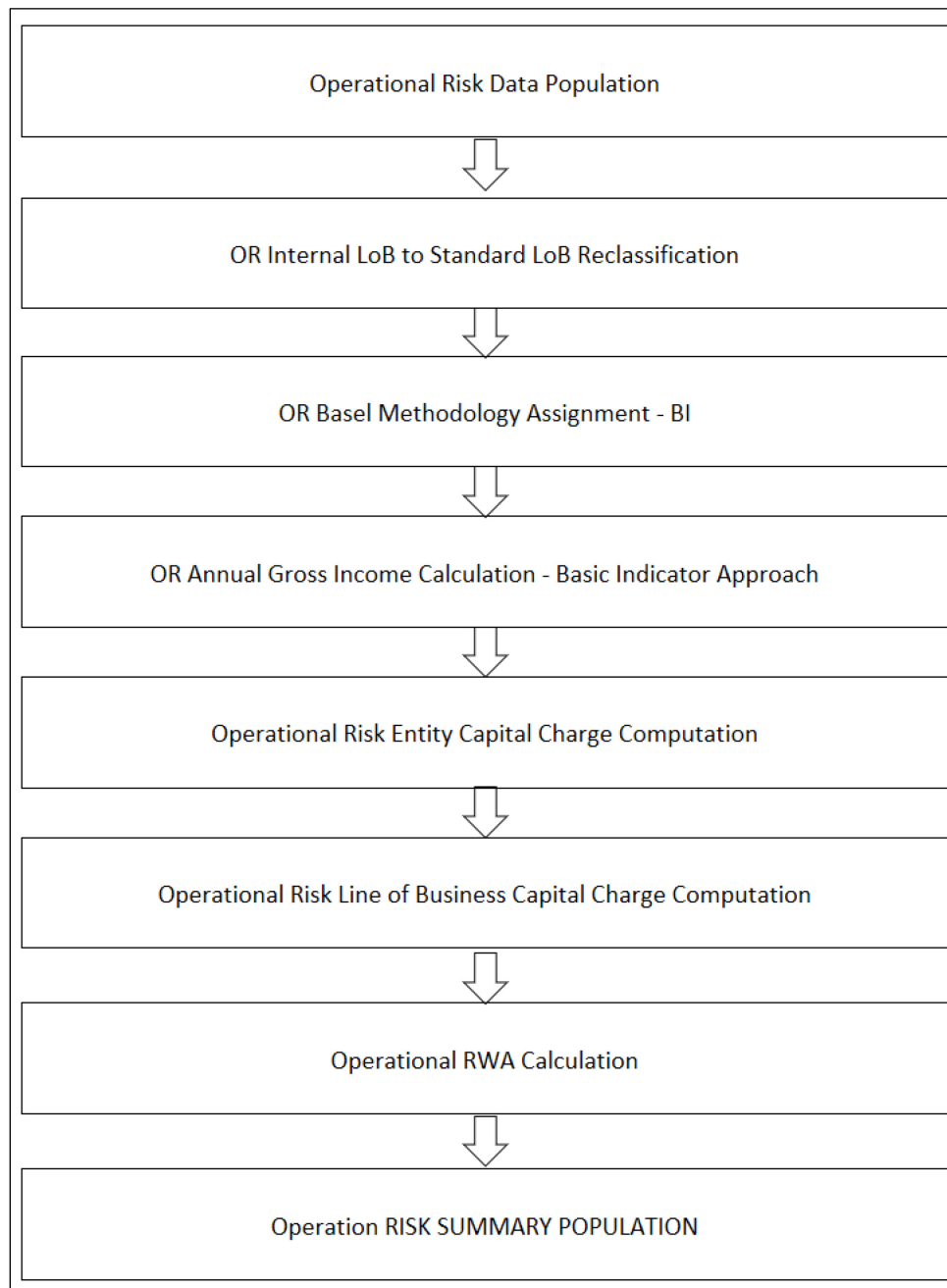
10.5.4.2 Standardized Approach

In this approach, the LOB reclassification is expected to reflect the relevant LOB provided by the regulator.

10.5.4.2.1 Capital Charge Calculation

Capital charge is calculated by multiplying the beta value with the annual gross income of each year across each standard line of business. The average of 3 years is considered by the application, in sync with the regulatory ask.If the values of all the 3 years are not positive, then zero or the negative value from numerator and denominator is excluded.

In this approach, the beta value is a fixed value set by the regulator, for each of the individual Lines of business.

This is handled in the in rule

Operational Risk Entity Capital Charge Computation

Operational Risk Line of Business Capital Charge Computation

10.5.4.2.2 Risk-Weight Asset Calculation

The capital charge value obtained is converted to the equivalent RWA value by multiplying with the factor of 12.5.

Operational Risk-Standardized Approach - Data Population

Figure 86: Process Flow for Operational Risk-Standardized Approach - Data Population

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┌─────────────────────────────────────────────────────────────┐
│              Operational Risk Data Population                │
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                              ⇩
┌─────────────────────────────────────────────────────────────┐
│        OR Internal LoB to Standard LoB Reclassification       │
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                              ⇩
┌─────────────────────────────────────────────────────────────┐
│            OR Basel Methodology Assignment - SA              │
└─────────────────────────────────────────────────────────────┘
                              ⇩
┌─────────────────────────────────────────────────────────────┐
│    OR Annual Gross Income Calculation - Standardized Approach │
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                              ⇩
┌─────────────────────────────────────────────────────────────┐
│                 OR Beta Factor Calculation                   │
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                              ⇩
┌─────────────────────────────────────────────────────────────┐
│     Operational Risk Entity Capital Charge Computation       │
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│  Operational Risk Line of Business Capital Charge Computation │
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┌─────────────────────────────────────────────────────────────┐
│                Operational RWA Calculation                   │
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┌─────────────────────────────────────────────────────────────┐
│             Operation RISK SUMMARY POPULATION                │
└─────────────────────────────────────────────────────────────┘
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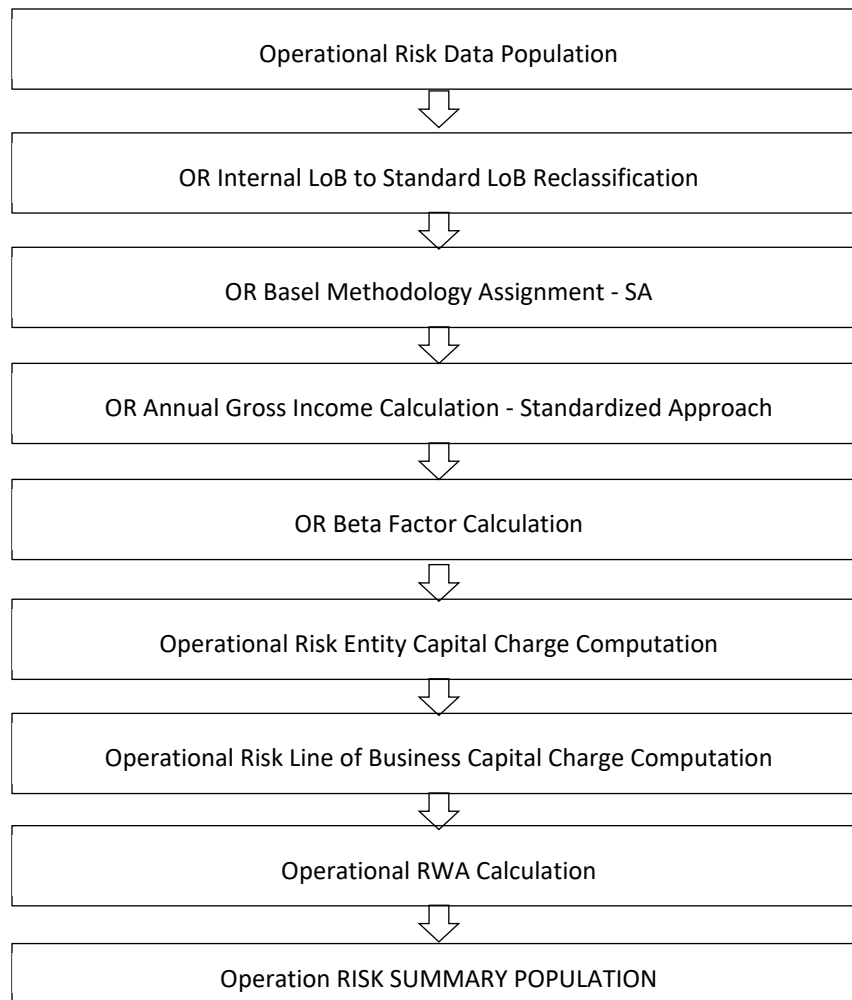
10.5.4.3 Alternative Standardized Approach

This approach is an extension of the standardized approach. In this approach for two lines of business: Retail Banking and Commercial Banking, the loan and advance amount is used (rather than annual gross income) which is multiplied by the fixed factor "m" and the beta factor.

10.5.4.3.1 Capital Charge Calculation

Capital charge is calculated by multiplying the beta value with the gross income specified for each of the LOB, for each year across each standard line of business. The average of 3 years is considered by the application, in sync with the regulatory ask. If the values of all the 3 years are not positive, then zero or the negative value from numerator and denominator is excluded.

In this approach, the beta value is a fixed value set by the regulator, for each of the individual Lines of business, and they are also being multiplied by the fixed factor of m.

This is handled in the rule OR_Capital_Std_App.

10.5.4.3.2 Risk-Weight Asset Calculation

The capital charge value obtained is converted to the equivalent RWA value by multiplying with the factor of 12.5.

Operational Risk – Alternative Standardized Approach - Data Population

Figure 87: Process Flow for Operational Risk – Alternative Standardized Approach - Data Population

Operational Risk Data Population

⬇

OR Internal LoB to Standard LoB Reclassification

⬇

OR Basel Methodology Assignment - ASA

⬇

OR Annual Gross Income Calculation – Alternative Standardized Approach

⬇

OR Beta Factor Calculation

⬇

Operational Risk Entity Capital Charge Computation

⬇

Operational Risk Line of Business Capital Charge Computation

⬇

Operational RWA Calculation

⬇

Operation RISK SUMMARY POPULATION

10.5.5   Key Data Elements

Key data elements that noted while calculating the capital charge for OR for the consolidated entity.

To view the complete list of tables used for Operational Risk computation, see the Download Specification document.

Entity details, which are part of regulatory consolidation and parent entity shareholding percent is required. These details are captured in the Stage Entity Shareholding Details (STG_ENTITY_SHR_HLD_PERCENT) table.

Net Interest Income, Net Provision Amount, Net Non Interest Income, Operating Expenses, Security Sale Gain or Loss from HTM, Insurance Irregular Loss, Security Sale Gain or Loss from AFS, and Insurance Irregular Gain for each line of business and for each financial year is required.

10.6   Capital Structure

During the economic crisis, the global banking system had an insufficient level of high level quality capital. During the crisis, it was identified that there was inconsistency in the definition of capital across jurisdictions and lack of disclosure. To address this issue of inconsistency, the Basel committee has prescribed a new definition of capital to strengthen the global capital framework under Basel III.

Figure 88: Process Flow for Capital Structure

As per the new definition in the Basel III accord, total capital consists of sum of the following elements:

- Tier1 Capital, which comprises of the following components,

  - Common Equity Tier 1

  - Additional Tier 1

- Tier 2 Capital

Each component of capital is subject to restrictions where CET1 must be at least 4.5% of total risk-weighted asset. Tier 1 capital must be at least 6.0% of total risk-weighted asset. Total capital must be 8.0% of total risk-weighted asset. Each component of capital undergoes minority interest and regulatory adjustments. The minority interest is applicable for a consolidated entity only, during the consolidation run. Most of the regulatory adjustment line items are to be deducted from CET1.

All the regulatory adjustment line items follow a phase-in arrangement from the beginning of 2014 till 2017.

In particular, the regulatory adjustments begin at 20% of the required adjustments to Common Equity Tier 1 on 1 January 2014, 40% on 1 January 2015, 60% on 1 January 2016, 80% on 1 January 2017, and reaches 100% on 1 January 2018.The same transition approach applies for all deductions from additional Tier 1 and Tier 2 capital.

While executing Solo Run the parent entity data is processed. Investment into the subsidiary data is processed as per Credit Risk and Market Risk rule. Capital line item pertaining to parent entity is only processed.

While executing Consolidation Run, the parent entity and the subsidiary data is considered.

10.6.1   Assumption

Investments in accounting entities (which are outside the scope of regulatory consolidation) by parent bank are long-term investments and mostly equity related instruments, hence these investments are not processed for Credit Risk Mitigation.

The GL codes are expected to be unique across entities in Stage General Ledger Data (STG_GL_DATA) and Capital Accounting Head Dimension (DIM_CAPITAL_ACCT_HEAD).

10.6.2   Data Population

Exposure level input for capital structure will flow from different stage portfolio tables.

Along with the portfolio level stage tables, application uses these below table,

Stage GL DATA (STG_GL_DATA),Stage Gl master(STG_GL_MASTER),Stage Party Share Holding Percentage (STG_PARTY_SHR_HLD_PERCENT),Stage Entity Share Holding Percentage (STG_ENTITY_SHR_HLD_PERCENT),Dim Organization Structure (DIM_ORG_STRUCTURE),Stage Standard Accounting Head (STG_STANDARD_ACCT_HEAD),Stage Legal Entity Details (STG_LEGAL_ENTITY_DETAILS), FSI_SETUP_CAPITAL_SOURCE (In this table application stores the CAPID details for example the capital component group or if it is eligible for transition),FSI_SETUP_CAPITAL_HEAD (In this table application stores all the seeded ratios as per regulatory guidelines).

10.6.3   Shareholding Percent Multiplication

Based on the share-holding percentage of the parent bank in the subsidiary and the consolidation approach to be followed for each of the entity, the Basel approach is selected.

For example: if the share-holding for an entity is 35% and is part of the consolidation process, then the approach selected for this entity is pro-rata consolidation. The reclassification is performed in task – 'Basel

III Capital Consolidation Basel Approach Type Reclassification for an Entity' in the process '**CAPITAL_CONSOLIDATION AND PARAMETER ASSIGNMENT'**.

The entity level population is part of BIS Common Data Processing (PMFCOM020) process. The application updates the shareholding percentage against each entity common data in the fact capital accounting head from the fact entity shareholding percent table and update the capital accounting head amount multiplying with the shareholding percent of that particular entity. The parent data in the processing table of fact capital accounting head is updated with the value 1 and for each child entity, the data is based on the parent's holding percentage specified for each child in fact entity shareholding percent table.

10.6.4 Common Reclassification Rules

There is certain reclassification which are specific to the capital structure process – standard accounting head reclassification, and entity type reclassification.

Capital to Standard Accounting Head Reclassification:

This is the reclassification of the Capital accounting head to standard accounting head. In this, all the Capital accounting heads of the bank need to be reclassified into the Standard Accounting Head, as that is the one which is being consumed in the application. This happens in the COMMON_RECLASSIFICATION (PMFCOM005) sub-process process in Common Data Processing (PMFCOM006).

Entity Type Reclassification:

The entity type reclassification is also handled as part of the Party Type reclassification since there cannot be difference in the party type and entity type.

This happens in the BIS Other Reclassification (PMFCOM010) process.

Product to Capital Component Group Reclassification:

This reclassification of the product to the capital component group is based on the Basel Product type, and this is handled at the individual portfolio tables of Investments and Derivatives. For investments this happens in the process INV_CAPITAL_STRUCTURE_RECLASSIFICATION_STD (PMFINV005) and for derivatives this happens in the DRV_RECLASSIFICATION_STD (PMFDRV012) in the process.

10.6.5 Gross Capital Calculations

For Gross Capital calculation all the components are classified into their respective tiers (CET1, AT1, and T2) based on the standard accounting head, and the specifications as mentioned by the regulator. The total gross capital for each tier of capital (CET1, AT1, and T2) is calculated as per the definition of CET1, AT1, and T2 by adding the relevant financial instrument in each tier of capital. This is processed using GROSS_CAPITAL_CALCULATIONS (PMFBISCS006) sub processes in **Capital Structure Data Processing (PMFBISCS021)** process.

10.6.6 Minority Interest Calculations

Surplus of Minority Interest

Minority Interests are calculated and the surplus amount in each tier of capital, which is attributed to third parties, are deducted from the gross capital of each tier of capital.

Minority interest is the amount that is attributable to any other party, which is not part of the bank's entities, and have shareholding in the entity. The surplus of minority interest is calculated as the third party's interest (shareholding percent) in the surplus capital (available capital – minimum required capital).

- All the values required for processing are populated into Minority Interest Capital (**FSI_MINORITY_INTEREST**) table which is the processing table for minority interest calculations.

- The sub process – MINORITY_INTEREST_CALCULATIONS (PMFBISCS001) in Capital Structure Data Processing (PMFBISCS021) process covers this processing.

- The minority interest is deducted from the gross capital of each tier of the capital.

10.6.7 Internal Transactions Deduction

The deduction also includes internal transactions in each tier of capital among the various entities which are part of the regulatory consolidation. This is to ensure that there is no double counting of exposures. This is handled in the process CAPITAL_STANDARD_ACCOUNTING_POPULATION (PMFBISCS002).

10.6.8 Regulatory Adjustments & Deductions from Each Tier of Capital

All the regulatory adjustment line items are expected as download in the Stage General Ledger Data table (STG_GL_DATA). Some of these line items are Good will, Other Intangibles, Deferred Tax Assets, Cash flow hedge reserve and so on. The related deferred tax liabilities are also expected to be provided as a download. The application calculates the values net of DTL and then processes it for the Regulatory Adjustments. The detailed list of these line items is part of the FSI Setup Capital Source (FSI_SETUP_CAPITAL_SOURCE) table.

The sub process – REGULATORY_ADJUSTMENTS_DEDUCTION_CALCULATION (PMFBISCS004) and PROVISION_CALCULATION (PMFBISCS005) in Capital Structure Data Processing (PMFBISCS021) process handle this requirement.

10.6.9 Certain Deductions part of Corresponding Deduction Approach

There are certain deductions which are expected to be part of each of the tier of capital. And they follow the corresponding deduction approach, wherein the deduction of the line item happens in the same tier of capital to which the exposure belongs to. This is being mostly pulled from the relevant

10.6.9.1 Investment in Own Shares

The investment in own shares are calculated as the sum of the pre-mitigation EAD (EAD Pre-mitigation Measure Value (**N_EAD_PRE_MITIGATION**). The source for investment in own share is the individual portfolio table.

The source for Non-Sec exposures is FSI Cap Investment Exposures (FSI_CAP_INVESTMENT_EXPOSURES), and FSI Cap Derivative Exposures (FSI_CAP_DERIVATIVES). The process where this is being handled is Capita Structure Data Processing (PMFBISCS021).

This populates into the Fact Calc accounting head (fct_calc_acct_head). This is being populated for each of the respective tier of capital.

The Investment in own shares is being calculated in the task INV_DRV_DEDUCTION_CALC_ACCT_HEAD_DATA_POP in Capital Structure Data Population (PMFBISCS019) process.

This also goes for phase in calculations, which is being handled in the PHASE_IN_DEDUCTION_CALCULATIONS (PMFBISCS007) process.

10.6.9.2   Reciprocal Cross-holdings

The Investment in reciprocal cross-holdings are calculated as the sum of the pre-mitigation EAD (EAD Pre-mitigation Measure Value) (**N_EAD_PRE_MITIGATION**) in FSI Cap Investment Exposures (**FSI_CAP_INVESTMENT_EXPOSURES**), and FSI Cap Derivative Exposures (**FSI_CAP_DERIVATIVE**) of the exposures which have the flag of reciprocal cross-holding indicator (**F_RECIPROCAL_CROSS_HLDG_IND**) as "Y".

For this processing, the reciprocal amount is expected as a download in the Stage Capital Investments Position Table (**STG_CAP_INVESTMENTS_POSITIONS**) at an instrument level. The instrument code provided in this table is the instrument in which the reporting bank has invested, and for which there is a reciprocal cross-holding by the reporting bank. The reciprocal cross-holding amount is also captured in this table. The application expects the staging data of the exposures to have the reciprocal cross-holding indicator (**F_RECIPROCAL_CROSS_HLDG_IND**) as 'Y'.

The application uses this INV_DRV_DEDUCTION_CALC_ACCT_HEAD_DATA_POP task in Capital Structure Data Population (**PMFBISCS019**) process to populate into the Fact Calc accounting head (**FCT_CALC_ACCT_HEAD**). This is being populated for each of the respective tier of capital.

This also goes for phase in calculations, which is being handled in the PHASE_IN_DEDUCTION_CALCULATIONS (**PMFBISCS007**) process.

And finally, the adjusted amount after deductions it goes back to the exposure level,

which is being handled in the CAPITAL_STRUCTURE_DEDUCTIONS_RWA_EXPOSURES (**PMFBISCS022**) from the process Capital Structure Data Processing (**PMFBISCS021**).

The exposure that meets the reciprocal cross-holding amount is stamped with the reciprocal cross-holding indicator (**F_RECIPROCAL_CROSS_HLDG_IND**) as 'Y'. This will be reduced in all the amount columns in FSI Cap Investment Exposures (**FSI_CAP_INVESTMENT_EXPOSURES**), and FSI Cap Derivative Exposures (**FSI_CAP_DERIVATIVES**) as per the reciprocal cross-holding ratio and store the actual amounts in FSI CAP DEDUCTION EXPOSURE table (**FSI_CAP_DEDUCTION_EXPOSURES**).

The portion of the exposure, which is above the reciprocal cross-holding amount is treated as a regular exposure and is risk-weighted as per the Basel asset class for that instrument.

10.6.9.3   Insignificant Investment

Investment in all financial entities, which are outside the scope of regulatory consolidation, is identified for significant and insignificant investments.

The shareholding percent for these parties are expected as download in Stage Party Shareholding Percent table (**STG_PARTY_SHR_HLD_PERCENT**). Any party which part of the Org Structure is, but is not part of the regulatory consolidation, can also qualify for this treatment, if it is financial entity. If the entity is part of the Org structure, the shareholding percent is expected in the Stage Entity Shareholding percent table (**STG_ENTITY_SHR_HLD_PERCENT**).

The parties are identified as significant when the shareholding percentage is greater than or equal to 10%. And the others are identified as insignificant investment. This processing happens in the **PARTY_SHAREHOLDING_PERCENT** process.

The total investment amount in insignificant entities is computed by summing up the Pre-mitigation EAD (EAD Pre-mitigation Measure Value (N_EAD_PRE_MITIGATION)) from the portfolio tables FSI Cap Investment Exposures (FSI_CAP_INVESTMENT_EXPOSURES), and FSI Cap Derivative Exposures (FSI_CAP_DERIVATIVES). And also, the tier wise computation of investment amount happens. The total amount is compared with the 10% of the CET1 amount of the parent bank amount post regulatory adjustments. The amount above 10% limit is processed for deduction.

This summing up includes the direct, indirect and synthetic investments. The Indirect investments are investments in Investment funds, and which are invested in capital instruments. The synthetic investments are the investments in synthetic transactions on capital instruments. For all these exposures, the net long position amount, updated in **N_EAD_PRE_MITIGATION** is considered.

This is expected for all capital positions, and not for specific capital position.

The total deduction amount is pro-rated among each tier of capital based on the percentage of investment in each tier of capital. The amount arrived is deducted from each tier of Capital.

The investment amount below the 10% limit is treated as per banking book rule for the instrument.

The application computes as follows:

Parties are marked as insignificant investment parties by updating the flag: Significant Entity Indicator (**F_SIGNIFICANT_INVESTMENT_IND**) in Fact Party Shareholding Percent (**FCT_PARTY_SHR_HLD_PCT**) with value N, and **F_SIGNIFICANT_INVESTMENT_IND** in Fact Entity Info (**FCT_ENTITY_INFO**) with value N.

- The exposure amount of banking book and trading book exposures (any counterparty credit risk exposures) to these entities are summed by grouping their component of capital and compared against 10% of parent bank's CET1 capital. The portion of amount which exceeds the 10% limit is deducted.

- This is computed by calculating tier wise deduction percentage and multiplying this percentage with the exposure amount to arrive at the amount to be deducted from each tier of capital.

- The total investment values are populated into Non-Regulatory Consolidation Entity Investment (**FSI_NON_REG_CONSL_ENTITY_INVST**) table which is the processing table for insignificant and significant investment deductions.

- The sub process – INSIGNIFICANT_INVESTMENT_IN_ENTITIES_OUTSIDE_REG_CONSOLIDATION_PROCESSING (PMFBISCS010) in Capital Structure Data Processing (PMFBISCS021) covers the processing.

- After the application of this treatment, the Insignificant Investments line item also follow phase–in arrangement which is similar to the phase-in arrangement for Regulatory Adjustments.

10.6.9.4 Significant Investment

The total investment amount is checked against the set limit of 10% of CET1 amount of the parent bank, post insignificant investment amount adjustment. The CET1 amount above 10% is deducted from the CET1 post insignificant investment amount deduction. The CET1 amount below 10% follows threshold deduction. The investment amount in AT1 and T2 is fully deducted from its respective AT1 and T2 tier of capital. The application computes as follows:

Entities are marked as significant investment entities by updating the flag – Significant Entity Indicator (**F_SIGNIFICANT_INVESTMENT_IND**) in Fact Party Shareholding Percent (**FCT_PARTY_SHR_HLD_PCT**)

with value Y and Significant Entity Indicator (**F_SIGNIFICANT_INVESTMENT_IND**) in Fact Entity Information (**FCT_ENTITY_INFO**) with value 'Y'.

The exposure amount of banking book and trading book exposures (any counterparty credit risk exposures) to these entities are summed by grouping their component of capital and compared against 10% of parent bank's CET1 capital. The portion of amount which exceeds the 10% limit is deducted from CET1. The exposures of AT1 and T2 are fully deducted from respective tier of capital. This is done by calculating deduction percentage for CET1 and by multiplying this percentage with the CET1 exposure's exposure amount to arrive at the amount to be deducted from CET1 capital.

The sub process – SIGNIFICANT_INVESTMENT_IN_ENTITIES_OUTSIDE_REG_CONSOLIDATION_PROCESSING (PMFBISCS011) in Capital Structure Data Processing (PMFBISCS021) covers the processing.

After the application of this treatment, the Significant Investments line item also follow phase–in arrangement which is similar to the phase-in arrangement for Regulatory Adjustments.

10.6.10   Threshold Deduction Treatment

Threshold Deduction is populated in the **FSI_THRESHOLD_TREATMENT** table and the threshold calculations are processed in this table

The line items, (Significant and insignificant Investment in the Common Shares of Accounting entities are populated from the FSI NON REGULATORY CONSOL ENTITY INVESTMENT table (FSI_NON_REG_CONSL_ENTITY_INVST), Mortgage Servicing Rights net of Deferred Tax Liabilities are populated from the Fact Standard Accounting head (FCT_STANDARD_ACCT_HEAD) table, and DTAs that arises from temporary differences are populated from the Fact Capital Accounting Head (FCT_CAPITAL_ACCT_HEAD).

The three-line items' significant investment in the common shares of BFSI where the bank owns more than 10%, Mortgage Servicing Rights (MSR), and DTAs that arises from temporary differences is processed for threshold deduction are populated in the Capital Threshold Treatment (**FSI_THRESHOLD_TREATMENT**) table and the threshold calculations are processed in this table. These three-line items are individually compared with the 10% of CET1 calculated Post Regulatory Adjustments, Insignificant Investments, and Significant Investment. The amounts which are above 10% CET1 limit are deducted from CET1 following the phase-in arrangements. During the transition period, any amount of these three-line items, which is not deducted as per the 10% mentioned earlier, is summed up for the aggregate 15% limit check. During the transition period, the check of 15% is against the CET1 post all regulatory adjustments and adjustments to insignificant investments and significant investments and the individual threshold deduction. In the post transition period, instead of 15%, the aggregate check is 17.65% of CET1, post all regulatory adjustments and adjustments to insignificant investments, less 100% of the sum of the line items which goes for threshold deduction.

The amount which is not deducted due to this 10% and 15% check is risk-weighted 250% during the transition period and is risk-weighted 250% post the transition period. The entire processing is done in the sub process – 'THRESHOLD_TREATMENT_CALCULATIONS (PMFBISCS012) in Capital Structure Data Processing (PMFBISCS021).

10.6.11   Net Capital Calculations

The net CET1, net AT1, and net T2 capital amount are calculated post all regulatory adjustments. Any shortfall in T2 capital amount is adjusted against Net AT1 amount and any shortfall of AT1 capital amount is adjusted against Net CET1 amount.

This is done in sub process – NET_CAPITAL_CALCULATIONS (PMFBISCS014) in Capital Structure Data Processing (PMFBISCS023)

For RWA, RWA_POPULATIONS (PMFBISCS016) in Capital Structure Data Processing (PMFBISCS023).

For net capital it is NET_CAPITAL_CALCULATIONS (PMFBISCS014) in Capital Structure Data Processing (PMFBISCS023).

10.6.11.1   Total RWA Calculations

The RWA amount for Credit Risk - Non-Securitization, Counterparty Credit Risk, Credit Valuation Adjustment Risk Weighted Asset, Credit Risk - Securitization, Market Risk, and Operational Risk and Regulatory Capital Phase in Related RWA are calculated by summing up the RWA amount.

The Phase-In RWA captures the capital instrument investments that goes for deduction from Capital but because of Phase-In arrangement are to be risk-weighted such as – Reciprocal Cross-holding, Treasury Stock, Insignificant Investment amount, Significant Investment amount and Threshold deduction amount.

 These are reported under different Capital accounting heads such as 'Risk-weighted Asset amount for Standardized Portfolios/IRB portfolio' for Non-Securitization, "Sec Std RWA" for Securitization portfolio, "Market RWA" for Market Risk and "Operational RWA" for Operational Risk.

This is part of the RWA_POPULATIONS (PMFBISCS016) in Capital Structure Data Processing (PMFBISCS023).

10.6.11.2   Capital Ratio Calculations

Tier 1 capital ratio and capital adequacy ratio are calculated using the total RWA amount, net Tier 1 capital, and Total capital amount.

For capital ratio, the process is CAPITAL_RATIO_CALCULATIONS (PMFBISCS017) in Capital Structure Data Processing (PMFBISCS023).

10.6.11.3   Required Capital ratio

This process is handled in CAPITAL_RATIO_CALCULATIONS (PMFBISCS017).

In this the application calculates CET1 capital ratio, T1 capital ratio, T2 capital ratio and a total capital ratio summing all of them.

And the same is being compared with the required capital ratio provided as an input for the specific regulator. The required capital ratio is being provided as an input in the FSI Setup Capital Accounting Head (FSI_SETUP_CAPITAL_HEAD).

10.6.11.4   Deficit or Excess Capital

The shortfall is handled in the sub process Net capital calculations (PMFBISCS014).

Here the application calculates CET1 , AT1 and T2 capital shortfall amounts.

10.6.11.5 Key Data Elements

Key data elements to process the Capital Structure for the consolidated entity is as follows. For a complete list of tables and columns to be updated, see the Download Specifications document.

Entity details which are part of regulatory consolidation and parent entity shareholding percent. This data is captured in Stage Entity Shareholding Details (STG_ENTITY_SHR_HLD_PERCENT) table.

The capital structure component for each tier of capital for all entities involved in regulatory consolidation.

The total RWA, total CET1, AT1, and T2 amount and third-party percentage of holdings in each tier of capital for minority interest calculation.

The regulatory adjustment amount like goodwill, DTA, other intangible assets, cash flow hedge reserve, and defined pension fund asset, MSR, and so on.

The transaction of the investment amount for accounting entity which is outside the scope of regulatory consolidation.

The CET1, AT1, and T2 capital of the entity which has third party minority holdings in it are expected as a download in legal entity details (STG_LEGAL_ENTITY_DETAILS) table. Similarly, the third-party investment in each tier of capital is also expected as a download in legal entity details table.

The minimum required capital for each tier for each capital adequacy regulator (for the entity that has third party minority holding in it) is expected in the setup table - Setup Capital Heads (FSI_SETUP_CAPITAL_HEAD).

The Total RWA (CAP838) for the entity that has third party minority holding in it is a download value in Stage Standard Accounting Head (STG_STANDARD_ACCT_HEAD).

10.6.11.6 Limitations

The limitations in the release of OFSCAP 8.1.0.0 is as follows:

- **Investment in Own Shares Treatment**

  The investment in own shares which goes for capital treatment, has a phase-in treatment, wherein during phase-in a portion of the exposure goes for deduction from capital, and the remaining portion of the exposure goes for 100% RW. This is handled in the processing by the Phase-In treatment table, and this RW gets added into the Regulatory RWA Accounting Head.

  But for reporting, the reporting happens from an account level granularity, and not at a higher granularity of the accounting head. As the current application does not split the exposures into two in the processing portfolio tables, the account level and the Phase-In treatment table values do not reconcile with each other. Currently, this must be specifically addressed in the reporting layer and is not part of the OOB product.

10.6.12 Treatment for Qualified Holdings

Any significant capital investment in a non-financial party will qualify for this treatment. The qualifying holdings are the holdings which are outside the financial sector and wherein the bank has more than 10% holdings. The application identifies these based on the significant party identification, and the party attribute of whether they are a financial entity or not.

The sub process – Treatment of Qualifying Holdings Outside the Financial Sector in **EU_CAPITAL_STRUCTURE** process covers the above processing.

Threshold Check for the Qualifying Holdings

The Investment Amount (**N_EAD_PRE_MITIGATION**) is summed up for all the entities which have the **F_SIGNIFICANT_INVESTMENT_IND = Y,** and the financial entity indicator flag (**F_FINANCIAL_ENTITY_IND**) is N. This is populated into the table **FSI_HOLDING_OUTSIDE_FIN_SECTOR**.

These holdings are individually checked at party level with 15% of the eligible capital. And they are checked using aggregate value at the total level with 60% of the eligible capital. The greater of these two amounts will go for deduction from capital, or Risk weighting at 1250%, based on the run management option selected.

If the bank opts for deduction from capital, this is deducted from CET1 capital, and the Net CET1 Capital is calculated.

Post Phase-in Treatment for Insignificant Investments, Significant Investments, and Threshold Deductions

In this step, the balance phase-in deduction amount for Insignificant, Significant, and Threshold deductions are calculated, and they are assigned the applicable risk weight. The RWA of these amounts are also computed. The sub process – Post Phase In Treatment Calculations in **EU_CAPITAL_STRUCTURE** process covers the above processing.

10.7   Capital Buffers

Capital Buffer is calculated after the calculation of Capital Ratios, as they go as an input to Buffer calculation. Each sub-process is explained in detail under Capital Buffer section of the user guide.

For example, Required Capital Conservation Buffer and Required Countercyclical Buffer calculation are detailed in the 'Required Total Buffer' sub-section of the Capital Buffer section in this document. Similarly, Minimum Capital Conservation ratio is detailed in the 'Capital Conservation Ratio' sub section of Capital Buffer section in this document.

Figure 89: Process Flow for Capital Buffers
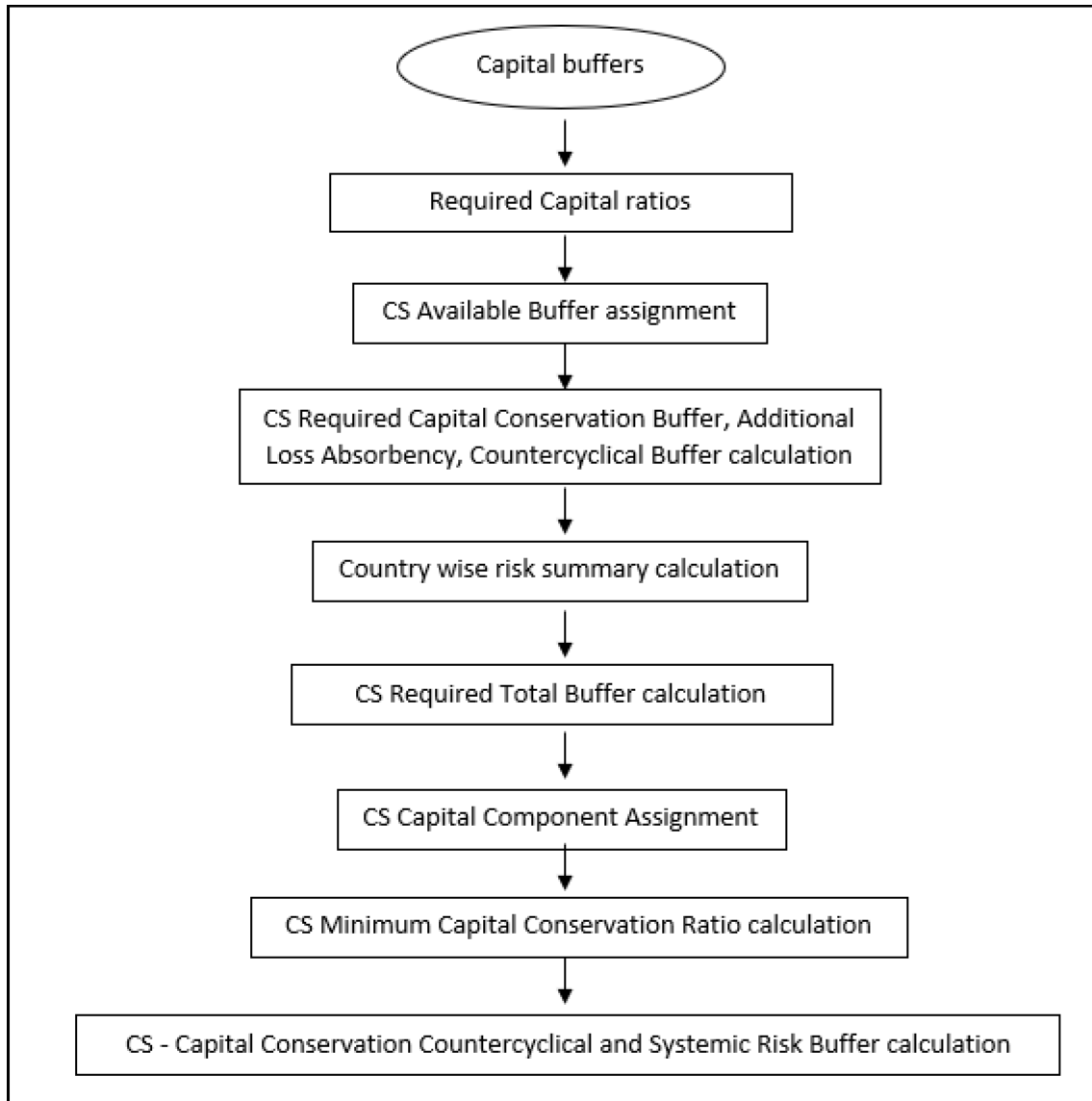
10.7.1 Data Population

The major input for capital buffers is the total capital ratio and the Net Common Equity Tier 1 Capital Ratios which gets computed as part of the capital structure process. This is consumed from the fact standard accounting head.

Along with that, the application consumes additional data related to buffers from the Stage Countrywide Risk Summary (STG_COUNTRYWISE_RISK_SUMMARY) which is used to populate country wise risk summary.

FSI Benchmark Capital Conservation Ratio (FSI_BENCHMARK_CAP_CONS_RATIO) and FSI Benchmark Countercyclical Buffer (FSI_BENCHMARK_CNTR_CYC_BUFFER).

10.7.2 Buffer Requirements

There are different types of Capital which the banks are expected to maintain:

- Capital Conservation Buffer

- Countercyclical Buffer

- Additional Loss Absorbency Capital (for G-SIB)

A detailed description of each of these buffers is provided in the following sections.

10.7.2.1 Capital Conservation buffer

As part of the Basel III compliance, requires banks are required to maintain Capital Conservation Buffer (CCB) out of Common Equity Tier 1 Capital (CET1).

This buffer is used to ensure that any loss should not erode the bank's capital, and hence it is expected to be met over and above the Required CET1 Capital. The actual required ratio for the jurisdiction is being specified in the FSI Setup Capital Head (FSI_SETUP_CAPITAL_HEAD).

10.7.2.2 Countercyclical Buffer

As part of the Basel III compliance, banks are required to maintain Countercyclical Buffer that is prescribed by the respective jurisdiction's regulator through an extension of Capital Conservation buffer.

The application calculates the buffer requirement for internationally active banks as the weighted average of the buffers required across all the jurisdictions to which the bank has exposures, weighted on basis of the exposure amount to different countries of the counterparty of their exposures.

If the guarantor and credit default swap is present for an exposure, then the application considers the domicile country of these mitigants for the covered portion and country of the exposure counterparty for uncovered portion. After calculating the weighted average, the application then computes a single value for Countercyclical Buffer benchmark which is applicable on all exposures of all jurisdictions.

10.7.2.3 Additional Loss Absorbency Buffer (GSIB Buffer)

If a banking organization is categorized a Globally–Systematically Important Banks (G-SIB), then the application identifies all subsidiaries in various jurisdictions as G-SIB as well. Based on this assessment, banks are assigned a GSIB score and the applicable bucket is decided. Identification of this bucket is based on the score as per the guidelines. Loss absorbency is required to be met as an extension of Capital Conservation and Countercyclical for computational buffer for computational purposes.

10.7.3 Required Buffers

Required Total Buffer (CAP825) is the sum of the three required buffers: (CAP829) Required Buffer from CET1 Capital, (CAP830) Required Buffer from Tier 1 Capital, (CAP831) Required Buffer from Capital Adequacy Ratio.

The calculated values (only positive values are considered) are stored against the corresponding Cap IDs as two separate line items of which one is 0.

The Required buffers as a percentage are provided as a download in the FSI Setup Capital Account Head (FSI_SETUP_CAPITAL_ACCCT_HEAD), as per the specific regulatory need. This is being multiplied by the Total RWA to arrive at the Required Buffer as an amount.

10.7.4   Assumptions

Countercyclical Buffer requirement for each country must be provided by the client or the bank as the final percentage applicable for each country and this is dependent on the home regulator. G-SIB status and applicable bucket information for each entity must also be provided by the client/bank.

For Required Weighted Average Countercyclical Buffer calculation, the exposures used in the bank are all accounts exposed to credit risk (Securitized and Non-Securitized) and those exposed to Market Risk. However, the application can be restructured to consider only those exposed to Credit Risk.

In Capital Conservation Ratio, for the computation of the quartiles that are used to arrive at Minimum Capital Conservation Ratio, the application is dependent on the required CCB ratio. From 2013 till 2016, CCB requirements keep changing every year as per the transitional arrangement, For the purpose of calculating the quartiles range, the application considers it as per the transitional arrangement. At the same time, the application has the flexibility to have the required CCB constant at 2.5% throughout. Also, the minimum required CET1 Ratio considered for the purpose of building these quartiles is 4.5%.

10.7.5   Key Data Elements

Key data elements are elaborated in this section. For a complete list of tables to be updated, see the Download Specifications document.

Countercyclical Buffer requirement for each country must be provided by the client or the bank as the percentage applicable for each country is dependent on the home regulator's jurisdiction. The home regulator's jurisdiction can prescribe Countercyclical Buffer percentage that is higher than the percentage prescribed by the regulator of exposure country. Hence, the required Countercyclical Buffer percentage for each exposure country provided as input must be the one that the home regulator agrees to.

G-SIB status and applicable bucket information for each entity must be provided by the client or the bank. In case of a consolidated Run, loss absorbency charges applicable to the parent, as required by the regulator of parent, is applicable to the complete Run. This Run output is supposed to be reported to the jurisdictional regulator of the parent. For a Solo Run, loss absorbency charges as required by regulator for a subsidiary entity are applicable. Hence, for Solo and Consolidated Runs, G-SIB status of the reporting bank, and the applicable bucket, is provided by the bank itself.

As the required Capital Conservation Buffer (CCB) must be met as per the transitional arrangement, therefore the required buffer value must be setup in Setup Capital Heads (**FSI_SETUP_CAPITAL_HEAD**) table for different periods against the standard account head ID CAP823. Different CCB requirements specified by the different regulators can be setup by specifying the regulator codes against the same standard account head ID. This regulator code must be the same as the jurisdiction code assigned by the Rule Jurisdiction Code Assignment.

The required benchmark of Countercyclical Buffer for different countries as set by different regulators is expected as download in Stage Benchmark Counter Cyclical Buffer (**STG_BENCHMARK_CNTR_CYC_BUFFER**). This data is populated to Benchmark Counter Cyclical Buffer Ratio (**FSI_BENCHMARK_CNTR_CYC_BUFFER**) using a Slowly Changing Dimension (SCD) process. Buffer requirement given on a date is valid till the next buffer is specified. For a solo Run, the regulator of subsidiary specified buffer requirements are considered and for consolidation Run, the consolidating entity's regulator specified buffer requirements are considered.

The Additional Loss Absorbency requirement specified by different regulators for different buckets must be setup in the table Benchmark Loss Absorbency Ratio (**FSI_SETUP_BENCHMARK_LOSS_ABS**). For the

solo Run, loss absorbency requirement set by the local regulator is considered. For consolidation Run, the consolidating entity's regulator specified loss absorbency requirement is considered.

There is an option to directly input the applicable loss absorbency percentage. This is also useful when the percentage applied is different from the corresponding bucket percentage. This must be provided in the column **N_LOSS_ABS_OVERRIDE** of the table Stage Legal Entity Details (**STG_LEGAL_ENTITY_DETAILS**). If this column has a value, it is given priority over loss absorbency percentage corresponding to the bucket.

The minimum Capital Conservation Ratios requirement for different quartiles (1, 0.8, 0.6, 0.4, 0) is expected as a download in Stage Benchmark Capital Conservation Ratio (**STG_BENCHMARK_CAP_CONS_RATIO**). This data is populated to the semi-static table Benchmark Capital Conservation Ratio (**FSI_BENCHMARK_CAP_CONS_RATIO**) using a SCD process. Conservation ratios specified once are valid till the next revision.

In the **FSI_REQUIRED_CNTR_CYC_BUFFER** table the post-mitigation exposure amount is updated against each country code. This is applicable for Credit Risk (for Non-Securitization and Securitization exposures) and Market Risk.

10.8   Large Exposures

The large exposure framework is a framework detailing on how the banks have to manage its exposures to various parties both at individual level, as well as to the group of connected clients' level.

The large exposure framework has to be complied with the bank at both solo and consolidated level. As part of the solo execution, the bank has to identify its large exposures, and comply within the required threshold limit.

As part of the consolidation execution, the bank has to identify the total large exposures at the consolidated level, and comply within the required threshold limit.

The solo and consolidation are as per the regulatory definitions and same as the one which is being used for the regular capital adequacy.

The large exposures are identified based on the comparison of the total individual party's exposures to the Tier 1 Capital, which changes based on whether it is a solo execution or consolidation execution.

10.8.1   Data Population

The large exposure computations require data pertaining to the various portfolios – banking, investment, derivatives, securities and financing transactions, and trading book exposures.

Non Securitization Data Population

Data must be loaded in the application for all the product types and is same as Capital Adequacy related data expectation.

See the individual portfolio for the data elements:

- Banking

- Investment

- Derivatives

- Securities Financing transactions

Data is loaded from the required portfolio tables into the table **FSI_LARGE_EXPOSURE_ACCT_DETAIL**. This table is used for Large Exposure calculations.

Mitigant Data Population

The data related to the mitigants associated to the exposures are captured in this process. This is also the same as the regular capital adequacy run related data.

For more information about Mitigant Data Population, see Mitigant Processing section.

Securitization Data Population

Data must be loaded in the application for all the relevant Securitization tables and is same as Capital Adequacy related data expectation.

For more information about securitization data population, see Securitization Data Population section

Trading book Data Population

Data must be loaded in the application for all the trading book exposures and is same as Capital Adequacy related data expectation.

For more details, refer Market Risk Data Population.

All these data are populated into the processing table of **FSI_LARGE_EXPOSURE_ACCT_DETAIL**.

Large exposure data population is handled in the sub-process **LARGE_EXPOSURE_DATA_POPULATION**.

10.8.2 Intra-group Assignment

This process identifies the group exempted parties in investments and derivatives. The process handling is **LARGE_EXPOSURE_INTRA_GROUP_ASSIGNMENT**.

10.8.2.1 Party Relationship Reclassification

All the relationships at party level are expected in the stage party –party relationship table (**STG_PARTY_PARTY_RELATIONSHIP**)

The Large Exposures computation require the details of the party's relationship to one another, since there are different limitation to the group exposure (which will be a group of connected counterparties based on various relationship types), and to individual counterparties (without considering any other related counterparties).

From a definition perspective, connected counterparties are individual entities that are considered as a group due to the direct or indirect control established between entities. This direct or indirect control is being identified based on the party-party relationship table, wherein each and every related party's information are provided, and the relationship type is also defined.

This is reclassified into the standard relationship type that is used for further processing and reporting. The party relationship type reclassification takes place in the sub-process **COMMON_RECLASSIFICATION** of the rule **Party Relationship Type Reclassification.**

COMMON_RECLASSIFICATION is a sub-process which is part of the **EU Common Data Processing** process.

10.8.3 Computation of the Direct Exposures

The direct exposures are the actual exposures that are in the bank's portfolio in the form of banking, derivatives and SFT exposures. In the case of investment portfolio, the direct exposures are the ones which are investment in the form of debt securities or equity, and which do not have any underlying dependencies. This is handled for individual counterparties.

This gets handled as part of the sub process **LARGE_EXP_PARTY_GROUP_EXP_POPULATION** which is part of the process **LARGE_EXPOSURE_DATA_PROCESSING**.

10.8.4 Computation of Indirect Exposures

The indirect exposures are the mitigants that have been provided to the exposures in the bank's portfolio in the form of banking, derivatives, investment and SFT exposures. This is handled for individual counterparties.

This gets handled as part of the sub process **LARGE_EXP_PARTY_GROUP_EXP_POPULATION** under the process **LARGE_EXPOSURE_DATA_PROCESSING**.

10.8.5 Computation of Synthetic Exposures

The synthetic exposures are the ones pertaining to Securitization and CIU, wherein there are synthetic exposures to the underlying of these transactions.

In this scenario, these exposures are computed by assigning them to the unknown clients or the actual counterparty to whom the underlying belongs to, depending on data availability.

This is handled for individual counterparties.

The computation of gross credit exposure for CIU/SPV is handled in the process **LARGE_EXP_SPV_UNDERLYING_PROCESSING**.

10.8.6 Exempted Exposures

There are certain exposures which are being exempted from the large exposure calculations. These are mostly as specified by the regulator, and include the cleared transactions, and other exposures that are deducted from capital, since it does not make sense to consider them in the large exposure calculations.

This is handled for individual counterparties.

Exemptions are classified into full exemptions and partial exemptions. Full exemptions have the exemption source as 'CRD' and exemption percentage of 100% is assigned to it.

Partial or supervisory exemptions have the exemption source as 'SUP' and exemption percentage of 0% is assigned to it.

Each exposure that is exempted has an exemption code stamped to it. The following table lists the various exemption codes and its descriptions.

Exemption Criteria Code	Exemption Criteria Description
EXMPT011	Exposures Guaranteed by Government Agency
EXMPT012	Exempted Trade Exposures of Qualifying Central Counterparty

Exemption Criteria Code	Exemption Criteria Description
EXMPT013	Exposures towards International Agencies with Strong Creditworthiness
EXMPT014	Other Specific Exemptions Defined by the Regulator
EXMPT015	Exempted Exposures of Intra Group

10.8.7 Calculation of Total Exposure to a Counterparty

Calculation of gross credit exposure depends on the specific product category of on-balance sheet, off-balance sheet exposure, derivative products, secured lending and borrowings, exposures arising from CIU, exposures arising from SPVs along with the exposures to third parties of the SPVs and trade exposures. Calculation also covers indirect exposures of the counterparty arising out of the mitigant exposures of the bank.

This is applicable for all the counterparties for which the bank has exposures in the form of either direct, indirect or synthetic exposures. This is handled in the sub-process **Large Exposures Counterparty Gross and Net Exposure Amount Calculation** in the process **LARGE_EXPOSURE_DATA_PROCESSING**.

10.8.8 Identification of Related Parties

It is expected that the party ID is the one for which it is considered as a related party. For example, if Bank A is related to party B, and party B is related to party C, it is expected that the data is provided for Bank A to party B, and Bank A to party C, to ensure that every mapping is being considered.

The solution sums up the exposures for all the counterparties belonging to the same parent, along with the parent, and populates the FSI Large Exposure Account Detail Table (**FSI_LARGE_EXPOSURE_ACCT_DETAIL**).

The expectation is that all the parties which are related to each other, have the Parent ID of the Party table as the same, or are part of the related party. Based on these related parties identified, and the parent id in the DIM_PARTY, the related parties are identified, and these are also considered as belonging to the same group.

This is handled in the sub-processes **LARGE_EXP_PARTY_GROUP_MEMBER_MAPPING** and **LARGE_EXP_PARTY_GROUP_EXP_POPULATION** in the process **LARGE_EXPOSURE_DATA_PROCESSING.**

On the party group, the threshold limit check is applied, and the large exposures are identified.

10.8.9 Total Capital of the Bank

This is used to calculate the total capital of the bank. This is computed as per the Capital Structure related calculations.

This is handled in the sub-process **LARGE EXPOSURE CAPITAL AMOUNTS POPULATION** in the process **LARGE_EXPOSURE_DATA_PROCESSING**.

10.8.10 Identification of Large Exposure Counterparties

The large exposures are identified based on whether the group exposure of the counterparties exceed the required threshold using the pre mitigation value. For EU, all exposures having Gross exposure amount greater than 10% of Tier 1 capital are considered as Large Exposures

This is handled in the rule **Large Exposure Flag Assignment** in the sub-process **EU LARGE EXPOSURE PARTY PARTY GROUP CALCULATION** of the process **LARGE_EXPOSURE_DATA_PROCESSING**.

10.8.11 Threshold criteria for Large Exposure Counterparties

The regulator indicates the threshold criterion below which the large exposures can be maintained by the bank. This threshold percent is assigned based on the standard party type of the counterparty, as specified by the regulator.

This is handled in the sub-process **Large Exposures Counterparty Threshold Amount Calculation** in the process **LARGE_EXPOSURE_COUNTERPARTY_PROCESSING.**

10.8.12 Large Exposure Breach Calculations

The application identifies whether there has been any breach to the large exposure threshold as specified by the regulator and are stamped a flag indicating that the counterparty as a group have breached it.

This is handled in the sub-**process Large Exposure Threshold Limit Breach Flag Assignment** in the sub-process **EU LARGE EXPOSURE PARTY PARTY GROUP CALCULATION in the process LARGE_EXPOSURE_DATA_PROCESSING.**

The breach amount is also calculated. This calculation is handled in the sub-process **EU - Large exposure threshold limit breach amount** in the sub-process **EU LARGE EXPOSURE PARTY PARTY GROUP CALCULATION** in the process **LARGE_EXPOSURE_DATA_PROCESSING**.

11   Annexure A: Key Concepts

11.1   Slow Changing Dimensions

This component details how to load data from the stage tables into the slowly changing dimension tables. SCD batches are run usually at fixed intervals, for example at the end of each month. There are certain SCDs which have to be run whenever any new data is required to be added for the bank.

When the SCD batch is executed for the first time it loads all the data in the stage tables for that extraction date and it also inserts two records – Missing and Others.

When the batch is run for the next extraction date, then the new records are inserted. The end dates of the modified records are updated with the extraction date and new records with start date as the extraction records are inserted. The records that are the same for both extraction dates are left untouched.

The SCD component is delivered through an executable.

Type 1 SCD Methodology

The Type 1 methodology overwrites old data with new data, and therefore does not track changes to the data across time. For Example, consider a dimension table, **DIM_PRODUCT**.

Table 20: Values in the DIM_Product table

N_Product_Skey	V_Product_Name	D_Start_Date	D_End_Date	F_Latest_Record_Indicator
1	PL	5/31/2010	12/31/9999	Y

The following is a description of the column names in this table:

- **N_Product_Skey** is the surrogate key column which is a unique key for each record in the dimension table.

- **V_Product_Name** is the product name.

- **D_Start_Date** indicates the date from which this product record is valid.

- **D_End_Date** indicates the date to which this product record is valid.

- **F_Latest_Record_Indicator**: A value Y indicates this is the latest record in the dimension table for this product and N indicates it is not.

If the **V_Product_Name** column is set as a Type 1 and if there is a change in the product name from PL to Personal Loan in the earlier example in the next processing period then, when SCD is executed then the record in the earlier example is changed to:

Table 21: Values in the DIM_Product table

N_Product_Skey	V_Product_Name	D_Start_Date	D_End_Date	D_End_Date F_Latest_Record_Indicator
1	Personal Loan	6/30/2010	12/31/9999	Y

Type 2 SCD Methodology

The Type 2 method tracks historical data by creating multiple records for a given natural key in the dimensional tables with separate surrogate keys. With Type 2, the historical changes in dimensional data are preserved. In the earlier example, for the change in product name from 'PL' to 'Personal Loan' if history is preserved, then the V_Product_Name column is set as Type 2, that is, when SCD is processed for the processing period, it inserts a new record as shown in the following example.

Table 22: Values in the DIM_Product table

N_Product_Skey	V_Product_Name	D_Start_Date	D_End_Date	F_Latest_Record_Indicator
1	PL	5/31/2010	12/31/9999	Y
1	Personal Loan	6/30/2010	12/31/9999	Y

A new record is inserted to the product dimension table with the new product name and the latest record indicator for this is set as 'Y' indicating this is the latest record for the personal loan product and the same flag for the earlier record is set to 'N'.

Prerequisites

The setup tables accessed by the SCD component, including **SYS_TBL_MASTER**, **SYS_STG_JOIN_MASTER** have the required entries. The tables **SYS_TBL_MASTER** and **SYS_STG_JOIN_MASTER** are seeded. You must only add entries in these tables if you add user defined dimensions.

Tables used by SCD Component

The **Stage Dimension Data Load** tab in the OFS Basel Regulatory Capital Run Chart Details_SAMA BASIC excel sheet lists out the SCD Stage and Dimension that are used in the BASEL Application.

No changes are needed in this table if the standard key dimensions are being used within the Basel Application. If any new dimensions are added, the related column details are to be inserted to this table manually.

STG_<dimensionname>_MASTER - is the database table which SCD uses as the source. This table comes as a part of the Data model.

DIM_<dimensionname> – is the output table to which SCD writes the dimension data.

A sequence is added for every user-defined dimension.

> **Example:**
>
> create sequence SEQ_DIM_<DIM> minvalue 1
>
> max value 999999999999999999999999999
>
> increment by 1

Executing SCD Components

For information on the configuration and execution of SCD components, see the Operations section in the Oracle Financial Services Analytical Applications Infrastructure 8.1 User Guide.

The Basel batch created for SCDs is the <infodom>_SCD. Infodom refers to the Information Domain name.

When the file is being executed you have the choice to either wait till the execution is complete or proceed with the next task. Click the list box of the field provided for Wait in the Value field and select Yes or No.

Clicking Yes confirms that you wish to wait for the execution to be completed. Clicking No indicates that you wish to proceed.

Stage Data

In this section, the stage data can be populated in either the Product Processors or Other Stage tables:

- **Product Processor**: An entity in the Basel Regulatory Capital application that stores data from the Operational Systems of the Bank. This entity is created based on the various financial products that the bank caters to. Stage tables for Product Processors are categorized as exposures data of Product Processors. The Product Processors of all the jurisdictions are the same, except for the Islamic Banking Jurisdiction.

- **Others**: Data can be populated into Stage tables, besides using Product Processors, as per the respective jurisdiction.

For more information on the list of columns to be populated within each table, see the Download Specifications document.

The set of sample data to be to be populated for the following tables are listed in the worksheet available in the following location: Sample Data.

- STG_PRODUCT_MASTER

- STG_LOB_MASTER

- STG_MITIGANT_TYPE_MASTER

- STG_PARTY_TYPE_MASTER

Seeded Data

The tables are seeded in the installation as per worksheet available in the following location: Seeded Data.

11.2   Exhibit 1 - Mitigant Allocation Optimizer

The application calculates the RWA based on the allocation of Credit Risk Mitigants (CRM) mapped to each exposure using a linear programming technique to arrive at the least capital. The optimizer engine, also known as the allocation engine, built within the application allocates Credit Risk Mitigants (CRM) to each exposure. The optimizer engine takes into consideration the following functionalities while allocating Credit Risk Mitigants (CRM) to each exposure:

There are certain checks which are specific to IRB, and the others are applicable for both Standardized approach and IRB approach.

11.2.1   Double Mitigant Treatment (Standardized Approach and IRB Approach)

You also have a choice to perform a Double Mitigant treatment where an exposure is covered by Collateral, a Guarantee, or a Credit derivative. The requirement in the form of a pre-configured rule at a Basel asset class level is to be specified by the institution. If you choose to perform a Double Mitigant treatment, then for a common portion of the exposure covered by both the mitigants, LGD of the Collateral, and PD of the Guarantee or Credit derivative is used. For the remainder, either the exposure is uncovered or any other mitigant if mapped to that exposure gets allocated. For Basel calculations, if use of Double Mitigant treatment results in a lesser RWA for an exposure, than use of a single mitigant, the

allocation logic allocates the mitigant based on Double Mitigant treatment or else the allocation continues as a case for normal mitigants.

11.2.2 Allocation of Mitigants (IRB Approach and Standardized Approach)

The following are the steps for credit risk mitigation irrespective of the approach prescribed in the Basel Accord.

- The mitigant is identified as eligible or not based on the eligibility rules for CRM under simple and comprehensive approach mentioned in Basel accord. This mitigant eligibility is handled in the FCT_MITIGANTS, and EXP_MITIGANT_MAPPING table.

- All mitigants which are eligible and mapped to an exposure are then populated to the processing table where each exposure is broken down by mitigant types, which includes an additional row treating the exposure as uncovered. This is handled in the FCT_SUB_EXPOSURES table.

- Further, RW assignment or Capital computation is performed for each Collateral or Mitigant. For financial collateral, under the BIS Standardized Approach, the RW used is 0. For FIRB approach the LGD used is the LGD* computed as per the Basel guideline. For any other mitigants in the form of Guarantees or Credit Derivative, the RW or PD corresponding to Basel rating or the modeling, as applicable, is used. For Advanced Approach, institutions must give the PD or LGD data either at a mitigant level or at an exposure level, if they are able to model the PD or LGD of the exposure.

- The Pooling is performed to identify the below cases.

  - One or Many Exposure to One Mitigant

  - One Exposures to Many Mitigants

  - Many Exposures to Many Mitigants

  - One Exposure with No Mitigant

The pooling of the exposures and the mitigants are based on the exposures mapped to the mitigants, and the same mitigant mapped to other exposures. For example, in the below exposure ID and the mitigant ID mapped to each other, all of them belong to the same pool ID, as they have the mitigants shared.

Exposure ID	Mitigant ID
EXP01	MIT01
EXP01	MIT02
EXP01	MIT03
EXP02	MIT01
EXP03	MIT04
EXO04	MIT04
EXP05	MIT05

The treatment of each of the pooled cases in the optimizer engine is detailed in the following section.

One or Many Exposure to One Mitigant

The case, one or many exposures to one mitigant is treated as follows by the optimizer engine:

- First, the exposures are sorted from highest risk weight to lowest. For advanced approach the sorting is based on the capital.

- EAD amount of each exposure (post credit conversion) is determined.

- The credit risk mitigant is allocated to the exposure with the highest risk weight.

- If there is more than one exposure with the same risk weight, then the exposure with the lowest currency mismatch haircut or maturity mismatch haircut is selected for allocation. In the case of Simple Approach, these haircuts will not be applicable, and hence, the volatility haircut and the currency mismatch haircut will be considered as 0, and the maturity mismatch haircut will be considered as 1.

- Currency haircut (Hfx) is applied to the collateral if there is a currency mismatch between the exposure and collateral. Likewise, for mitigants residual maturity falling short of exposure residual maturity a maturity mismatch haircut (Hm) is applied. These haircuts are assigned based on the Basel guideline.

- The post-haircut mitigant amount is applied to the exposure based on the previous logic. The allocation engine updates the covered factor against each row for all the exposures in a pool. For any exposure the sum of covered factor across rows is equal to 1.

- Finally, the pre-mitigation EAD is broken into post-mitigation EAD net of all haircuts

- Basel rules then calculate the RWA for each row by multiplying the post-mitigation EAD by the RW or capital * 12.5 (in case of advanced approach).

Any remaining collateral amount is applied to the next transaction with the next highest risk weight and so on.

One Exposure to Many Mitigants

The case, one exposure to many mitigants is treated as follows by the optimizer engine:

- First, the EAD amount of each exposure (post credit conversion) is determined.

- The mitigant is sorted from lowest to the highest risk weight for each exposure mapped to it.

- Each mitigant forming a part of Receivables, CRE/RRE, and Other IRB Collateral is adjusted for over collateralization amount while executing foundation IRB.

- In the Foundation IRB approach, Minimum collateralization check is performed for mitigants in the form of CRE/RRE and other eligible IRB Collateral by grouping the mitigant data in the numerator divided by the available EAD amount, minus any allocated mitigant amount.

  - Financial collaterals are allocated first, and then the minimum collateralization check is performed for the other type of mitigants.

  - The result checks whether it is greater than the percentages specified in the Basel Accord.

  - If the result value is less than the check value, none of the CRE or RRE or Other eligible IRB Collaterals mapped to the exposure is eligible for allocation.

  - This check is done only once for the mitigant mapped to each exposure.

- After all the checks are done then the computation starts by calculating the covered factor for the first row which is as follows:

  f1 = (Mitigant_value * Haircut)/ EAD

  Where:

  Haircut = (1 – volatilityHaircut – FOREXHaircut)*MaturityMismatchHaircut.

  The haircut related to volatility, currency mismatch and maturity mismatch are as mentioned in the One or Many Exposure to One Mitigant section.

- Then, the allocation logic works out the covered factor for the subsequent rows as follows:

  f(n)= Min ((1- Already allocated covered factor), Max (fn-1,0))

- Total covered factor for an exposure = Covered Factor for the 1st Row + Covered Factor for all the subsequent rows.

- Covered Factor is Sum of all Covered amount + Uncovered amount of the mitigant upon its total EAD. For any exposure the sum of covered factor across rows is equal to 1.

Many Exposures to Many Mitigants

In the case, many exposures to many mitigants the Optimizer uses a linear programming technique for which you must define the objective functions and a set of constraints for the variables. The objective function and the constraints in the Optimizer are defined as follows:

- Objective Function: Objective Function for CRM is to Minimize RWA

- Bounds for the output:

  - Lower Bound of Covered factor is 0

  - Upper Bound of Covered factor is 1

- Exposure Constraint: Exposure Constraint checks the sum of all the allocated exposure amounts must be equal to the total exposure amount available for allocation:

  (E1*x1) + (E1*x2) + (E1*x3) + (E1*x4) = E1

  Where,

  E1= Exposure amount

  X(n)=Allocation percentages (sum of x1……xn = 1, meaning 100%)

- Mitigant Constraint: Mitigant constraint has two objectives as follows:

  - This Constraint checks whether the total amount of mitigant is used is less than or equal to the total amount of mitigant available

  - All the mitigant haircuts are applied in this Constraint.

The formula is as follows:

[{ E1 * x1 } / { (1-V-Fx1)*(Mm1) }] + [{ E2 * x2 } / { (1-V-Fx2)*(Mm2) }] + [{ E3 * x3 } / { (1-V-Fx3)*(Mm3) }] <= M1

The Mitigant Constraint Formula table is provided below:

Exposure Amount	E1	E2	E3
Mitigant Amount	M1	M1	M1
Volatility Haircut	V	V	V
FOREX Haircut	Fx1	Fx2	Fx3
Maturity Mismatch	Mm1	Mm2	Mm3
Covered Factor	x1	x2	x3

- Minimum Collateralization Constraints are as follows:
  - Mitigants grouped for Deduction for Minimum Collateralization Check > 0
  - Mitigants grouped for Minimum Collateralization Check < 0

- Double Mitigant Constraint: Double Mitigant Constraint is similar to Mitigant Constraint the only difference being that, Mitigant Constraint is performed across one Mitigant ID however Double Mitigant Constraint is performed across the second Mitigant ID that of the Guarantee.

- Allocation engine updates the covered factor for each exposure based on the previous objective function and the constraints defined by you.

- Total covered factor for an exposure = Covered Factor for all the exposure mitigant combination pertaining to that exposure.

- Covered Factor is Sum of all Covered amount + Uncovered amount of the mitigant upon its total EAD. For any exposure the sum of covered factor across rows is equal to 1.

In case of exposure and mitigant having the same risk weight, the covered factor might get allocated to either the uncovered standard mitigant type, or the eligible mitigant, based on the highest mitigant value post haircut.

11.3 Exhibit 3: Currency Conversion

SETUP_MASTER table is a setup table, used to provide the setup information of a Run. It can be used to set the default values of Rate Data Source Code or Standard Currency Code. For currency conversion the rate data source and standard currency are important values. If the rate data source value is missing, then BLOOMBERG is by default considered to determine the Rate Data Source Code from DIM_ORG_STRUCTURE table during currency conversion. If the Standard Currency code values are not provided or are missing, then USD is used as the destination currency code from DIM_ORG_STRUCTURE table during currency conversion. This is column under DIM_ORG_STRUCTURE table mapped to these default values are as follows:

V_COMPONENT_CODE	V_COMPONENT_DESC	V_COMPONENT_VALUE
DEFAULT_FX_RATE_SRC	Default Rate Data Source Code	BLOOMBERG
STD_CCY_CD	Standard Currency Code	USD

Rule Reporting Currency Code Assignment is set to 'USD' out of box, but can be modified to any other currency. The reporting currency selection can be done in the Run execution windows, if the Run is executed from the Run Execution Window.

Currency conversion is performed on multiple tables to convert the values from its natural currency to reporting currency. The steps which are performed for the currency conversion are as follows:

- The table Stage Forward Exchange Rates (STG_FORWARD_EXCHG_RATES) stores the details about the pair of currencies and the corresponding exchange rate to perform the same with the extraction date for which the forward exchange rate is provided. This table also contains the information about the data source from which the exchange rates are quoted and the tenor which is used to identify the period for which the forward exchange rate is applicable for.

- The data from this table is populated to Exchange Rates fact table through the common batch which is executed in the beginning. The initial data populated hereby contains the default run Skey which is set to minus 1. Only the records with tenor 0 are used for the purpose of currency conversion for which the spot exchange rate is required.

- After populating the data in the table, in each Run, all the exchange rates are updated based on the conditions at the time of execution to account for the increase or decrease in the exchange rates. A Rule is used which updates the exchange rates and populates the corresponding run Skey which is then used for currency conversion in that particular Run. The exchange rates are then moved into the table wherever currency conversion is required. This is performed in the Product Processor data population step.

- Different legal entities can use the exchange rates quoted by different data sources. Hence, the column which contains the information about the data source in the table Exchange Rates is compared with the required data source for a legal entity stored in the Org Structure Dimension (DIM_ORG_STRUCTURE) table.

- After the exchange rate population into the required fact tables, the currency conversion rules are executed which take the values stored in amount columns in natural currency, multiply them with the exchange rate and populate to the reporting currency amount columns.

For mitigants table, the exchange rate that is used for currency conversion is the exchange rate for the entity of the exposure which the mitigant belongs to. The list of tables and corresponding columns where currency conversion is carried out is available in the following OTN Documentation Library location:

[Currency Conversion Tables and Columns](#)

11.4 Exhibit 4: FSI_CAPITAL_STANDARD_MAPPING Table Mapping

As a part of Basel Capital Structure, information stored in Capital Standard Mapping (FSI_CAPITAL_STANDARD_MAPPING) table is a mapping of GL capital line items with seeded data in Standard Accounting Head Dimension table (DIM_STD_ACCT_HEAD). This is also required for all the computed fields, so that the computation happens in the application for those standard accounting heads.

For all jurisdictions this mapping must be present which is elaborated in the following worksheet, available in the following OTN Documentation Library location:

[FSI CAPITAL STANDARD MAPPING](#)

11.5 Exhibit 5: Data Expectations for few of the Basel Products

11.5.1 Equity Exposures Data Expectations

The Equity Exposures and any other exposures which were expected to be treated under Equity Asset Class of the particular jurisdiction were expected in Stage Equity Exposures (STG_EQUITY_EXPOSURES) till 8.0.3 release of Basel application.

Starting from 8.0.4 release, any exposure which must be treated under Equity Asset Class is expected to be provided in Stage Investments (STG_INVESTMENTS).

For mandate-based approach in equity Investment in funds when there are no entries in STG_FUND_UNDERLYING_COMPOSITION, application assigns Fall Back Approach to the remaining exposures.

All the required attributes pertaining to Equity Exposures are expected to be provided in Stage Investments (STG_INVESTMENTS) and any Instrument Specific attributes in Instrument Contract Dimension table (DIM_INSTRUMENT_CONTRACT).

11.5.2 Securitization Exposures Data Expectations

The Securitization Exposures and any other exposures which were expected to be treated under Securitization framework of the particular jurisdiction were expected in Stage Securitization Exposures (STG_SEC_EXPOSURES) till 8.0.3 release of Basel application.

Starting from 8.0.4 release, any exposure which must be treated under Securitization Framework is expected to be provided in different product processors depending on the product type.

- If the exposure is to a securitization tranche, retained tranche or retained portion of the pool, it is expected in Stage Investments (STG_INVESTMENTS), with details of the pool ID and the tranche ID to which the exposure belongs to.

- If the exposure is a facility like liquidity facility or servicer cash advance facility, it is expected in Stage Commitment Contracts (STG_COMMITMENT_CONTRACTS), with the pool ID to which the facility is provided to. For any particular tranche level calculations required for SFA/ SSFA process, this must be created as a dummy tranche, and provided with details based on the seniority in the cash flows. In case of the commitment contract, which is issued under a credit line facility, the corresponding entry in Credit Line Dimension table (DIM_CREDIT_LINE) is required, with the mapping of the commitment contract to the credit line.

- If the exposure is a credit protection in the form of guarantee, it is expected in Stage Guarantees (STG_GUARANTEES), with the pool ID and the tranche ID to which the credit protection is provided to.

- If the exposure is a credit protection in the form of credit derivatives, it is expected in Stage Credit Derivatives (STG_CREDIT_DERIVATIVES), with the pool ID to which the credit protection is being provided to. For any particular tranche level calculations required for SFA/ SSFA process, this must be created as a dummy tranche, and provided with details based on the seniority in the cash flows.

The pool level aggregate information data capture (Securitization Pool table - STG_SECURITIZATION_POOL)) and the tranche level information data capture (Securitization Tranche table – STG_SECURITIZATION_TRANCHE)) remain the same as in previous releases. The pool's detailed

underlying information are captured in the Stage Underlying Exposures table (STG_UNDERLYING_EXPOSURES) for an investor.

In the case of underlying exposures data capture (STG_UNDERLYING_EXPOSURES), it is currently expected that for each exposure, the pool underlying has to be provided by creating a dummy exposure in the Underlying Exposures table with the Pool ID as the Exposure ID, and the Parent Account ID as the Exposure ID to which this pool detail belongs to. And further pool underlying exposures is created by having the Parent Account ID as the Dummy Pool Exposure ID.

Any Instrument Specific attributes are expected in Instrument Contract Dimension table (DIM_INSTRUMENT_CONTRACT).

11.5.3 Securities Financing Transaction Related Exposures Data Expectations

The Securities Financing Transaction (SFT) related exposures were expected in Stage Repo Contracts (STG_REPO_CONTRACTS), and all their related collateral were expected in Stage Underlying Exposures (STG_UNDERLYING_EXPOSURES) till 8.0.3 release of Basel application.

Starting from 8.0.4 release, there are changes to the capture of the collateral related to the SFT.

- The collateral which the bank has received with respect to the SFT transactions are captured in the Stage Mitigants (STG_MITIGANTS) table, with the SFT Exposure mapped to the collateral received using the Stage Account Mitigant Map (STG_ACCOUNT_MITIGANT_MAP) table.

- The collateral which the bank has placed with respect to the SFT transactions are captured in the Stage Placed collateral (STG_PLACED_COLLATERAL) with the SFT Exposure mapped to the collateral placed using the Stage Account Placed Collateral Map (STG_ACCT_PLACED_COLL_MAP) table.

Any Instrument Specific attributes are expected in Instrument Contract Dimension table (DIM_INSTRUMENT_CONTRACT)

11.5.4 Account Mitigant Mapping Data Expectations

Any account in the product processors, mapped to the various mitigants received were captured in the Stage Exposure Mitigant Mapping (STG_EXP_MITIGANT_MAPPINGS) till 8.0.4 release of Basel application.

Starting from 8.0.5 release, this is expected to be provided in the Stage Account Mitigant Map (STG_ACCOUNT_MITIGANT_MAP) table

11.5.5 Commitment Contract Data Expectations

Any commitment contracts issued by the bank were initially expected in Stage LC Contracts (STG_LC_CONTRACTS) till 8.0.4 release of Basel application.

Starting from 8.0.5 release, any exposure which a commitment contract is issued by the bank, is expected to be provided in the Stage Commitment Contracts (STG_COMMITMENT_CONTRACTS).

In the case of the commitment contracts issued under a credit line facility, then, the linkage of the credit line to the contract is required to be provided. The credit line is expected to be populated into the Dimension Credit Line (DIM_CREDIT_LINE) table.

11.5.6   Credit Line Issued Data Expectations

Any credit line, issued by the bank were initially expected in Stage LC Contracts (STG_LC_CONTRACTS) till 8.0.4 release of Basel application.

Starting from 8.0.5 release, any exposure which is a line of credit issued by the bank, is expected to be provided in the Stage Credit Line Details (STG_CREDIT_LINE_DETAILS) along with entries in the Dimension Credit Line (DIM_CREDIT_LINE) table.

The credit line table will hold information with respect to all the lines of credit issued by the bank. The lines of credit can be drawn for various products like Credit Card (corporate credit card issued to various employees under a credit line for that corporate), Loan commitments (loan issued to the customer as part of a credit line issued to that customer) and so on. This table will hold all the information related to the credit line, and any undrawn portion related to that credit line.

The drawn portion of the credit line, or the portion which has been earmarked for a specific product like credit card, will be part of the corresponding product processor (STG_CARDS, in this example), with the credit line code populated. And under that particular product, there can be both the drawn and undrawn portion, which will be captured in the same product processor (STG_CARDS, in this example).

The undrawn portion of the credit line will be the one which will be treated as line of credit, and will receive the corresponding Basel guideline specific treatment.,

11.5.7   Forward Contract Data Expectations

Any forward agreement or contract were initially expected in Stage Futures (STG_FUTURES) till 8.0.4 release of Basel application.

Starting from 8.0.5 release, any exposure which is a forward agreement, is expected to be provided in the Stage Forwards (STG_FORWARDS).

11.5.8   Asset Sold Data Expectations

Any assets sold with recourse were initially expected in Stage Loan contracts (STG_LOAN_CONTRACTS) till 8.0.4 release of Basel application.

Starting from 8.0.5 release, any exposure which is an asset sold, is expected to be provided in the Stage Assets sold (STG_ASSETS_SOLD). This will include all the assets sold by the bank. And the assets sold, for which the bank is retaining recourse will be part of the regulatory capital calculations, and that will be taken up for the Basel related processing.

11.5.9   Spot Forex Data Expectations

Any forex transaction, which is a spot were initially expected in Stage Investments (STG_INVESTMENTS) till 8.0.4 release of Basel application.

Starting from 8.0.5 release, any forex transaction which is a spot contract, is expected to be provided in the Stage Forex Contracts (STG_FX_CONTRACTS).

Note: All other forex transactions are expected to be populated in their respective derivative tables (Currency Swap in STG_SWAPS_CONTRACTS and so on).

11.5.10   Underlying Exposures for Derivatives

The underlying exposures for derivatives are now being captured through STG_UNDERLYING_MASTER.

The Data expectation for the underlying relationship for the derivatives is as follows:

- Case 1 – Both Parent derivative contract and underlying of the derivative are instruments:
    - This will involve usage of the two tables for capture of the underlying information – STG_UNDERLYING_MASTER/ DIM_UNDERLYING and STG_UNDERLYING_DTL
    - The parent account will be in one of the derivative contract, and the relationship between the parent and the underlying will be captured in the derivative tables as Underlying Instrument Code or the Underlying code
    - DIM_UNDERLYING will be used to store the static information about the underlying instruments, and STG_UNDERLYING_DTL will be used to store any variable information about the underlying instruments.
    - Data for STG_UNDERLYING_DTL
        - The STG_UNDERLYING_DTL can support the relationship reference of 1 parent to 1 underlying or multiple underlying instruments.
        - In this, the underlying instrument code will be provided as v_instrument_code and the parent's instrument code will be provided as v_contract_instrument_code
        - Both these instrument codes will have reference in dim_instrument_contract.
- Case 2 – If Parent derivative contract or underlying of the derivative are not instruments but instead are accounts or exposure:
    - This will involve usage of a single table for capture of the underlying information – STG_UNDERLYING_EXPOSURES.
    - The parent account will be in one of the derivative contract, and the relationship between the parent and the underlying will be captured in the underlying table as the parent exposure ID.
    - Data for STG_UNDERLYING_EXPOSURES.
        - The STG_UNDERLYING_EXPOSURES can support the relationship reference of 1 parent to 1 underlying or multiple underlying instruments.
        - In this, the underlying exposure will be provided as v_exposure_id and parent's exposure ID in v_parent_exposure_ID.
        - Both these exposure ID's will have reference in dim_exposure.

11.5.11   Underlying Exposures for CIU

The underlying exposures for CIU are now being captured through STG_UNDERLYING_MASTER.

The following is the data flow of underlying exposure of CIU:

- Case of Invested Mutual Fund
    - Invested portion will be in STG_INVESTMENTS
    - Any Fund related information which do not change will be in STG_INSTRUMENT_CONTRACT_MASTER

- Any Fund related information which changes frequently will be in STG_INTRUMENT_CONTRACT_DTL

- The composition of the fund will be in STG_FUND_UNDERLYNG_COMPOSITION

- The assets of the fund will be in STG_FUND_CIS_COMPOSITION

11.6 Exhibit 6: Design Changes

11.6.1 Design Changes for Handling Organization Structure

DIM ORG STRUCTURE flattening

From Release 8.1.0.0 onwards, for a selected Org Entity and the mode of execution either Solo or Consolidation, the application flattens the Org entries from DIM_ORG_STRUCTURE into a structure as follows.

Example for Dim Org Structure Data

Dim Org Account	Dim Org Parent
A1	A2
A2	A3
A3	A4

If you select, A3 as the Entity and Consolidation as execution type, the following data is populated in the flattened table:

Entity	Parent Entity	Consolidation Parent	Heir Level
A3	A3	A3	0
A3	A2	A3	1
A2	A1	A3	2

All the entities from Entity column from Consolidation Parent = A3 is picked up and populated into FCT_ENTITY_INFO table.

This step is done to avoid population of all unnecessary org structure data into FCT_ENTITY_INFO and later it is deleted once they are unused.

12 Annexure B

12.1 Download Specifications

For information, see [Download Specifications](#).

12.2 Using Process Modelling Framework

12.2.1 Basel CAP PACK Process Modelling Framework Filters and Decision Rules

PMF provides an option to apply filter hierarchies at the Run and/or Business Pipeline level. These filters are similar to the regular filter hierarchies used in rules. They get appended to each task in that business pipeline or Basel Run at run-time based on the applicability of the filter to that task.

In 8.1.1, CAP PACK makes use of two filter hierarchies, which apply through PMF. The filter hierarchies used are follows:

Figure 90: Filter Hierarchies for PMF

12.2.1.1 Exposure Approach Type

This hierarchy is based on the underlying seeded table FSI_CAP_APPROACH_TYPE_MASTER.

Used mainly to filter data in processing based on the approach selected by the user in the Advanced Run. Approach types are Standardized, Foundation IRB and Advanced IRB. Further, the approach is broken into the following matrix:

V_APPROACH_TYPE	V_APPROACH_TYPE_DESC
OTH	Others
NSSTD	Non Securitisation Standardized

V_APPROACH_TYPE	V_APPROACH_TYPE_DESC
NSFIRB	Non Securitisation FIRB
NSAIRB	Non Securitisation AIRB
SECSTD	Securitisation Standardized
SECIRB	Securitisation - Internal Rating Based Approach
MRSA	Market Risk Standardised Approach
MRIMM	Internal Models Approach
ORBIA	Basic Indicator Approach (BIA)
ORSA	Standardised Approach (SA)
ORASA	Alternative Standardised Approach (ASA)

For a task, if this table is part of the used tables list, then the filter chosen in the calling business pipeline or run pipeline is applicable to it. Used tables can be either part of the Dataset (for Rules) or Mapped/NonMapped column (for T2Ts).

12.2.1.2 Exposure Record Type

This hierarchy is based on the underlying seeded table FSI_CAP_RECORD_TYPE_MASTER. Used mainly to filter data of each portfolio for processing within or across portfolios. Depending upon the portfolio(s) the user picks as part of the run, the record type decides the type of data to be processed by each task in each portfolio. Record types currently supported are follows:

V_RECORD_TYPE	V_RECORD_TYPE_DESC
INV_NON_SEC_EXP	Investment Non Sec Exposure
INV_NON_SEC_ULY	Investment Non Sec Underlying
INV_SEC_ULY	Investment Sec Underlying
BNK_NON_SEC_EXP	Banking Non Sec Exposure
BNK_NON_SEC_ULY	Banking Non Sec Underlying
BNK_SEC_ULY	Banking Sec Underlying
DRV_NON_SEC_EXP	Derivatives Non Sec Exposure
DRV_NON_SEC_ULY	Derivatives Non Sec Underlying
DRV_SEC_ULY	Derivatives Sec Underlying
SFT_NON_SEC_EXP	SFT Non Sec Exposure
SFT_NON_SEC_ULY	SFT Non Sec Underlying
SFT_SEC_ULY	SFT Sec Underlying
OTH_PLACED_COLL_EXP	Other Placed Collateral Exposure

V_RECORD_TYPE	V_RECORD_TYPE_DESC
SFT_PLACED_COLL_EXP	SFT Placed Collateral Exposure
MITIGANT	Mitigant
SFT_MITIGANT	SFT Mitigant
OTH	Others

A simplified example of such a case can be Investment portfolio and Banking Portfolio for which data sources, besides other sources, are as follows:

- Securitization:
  - Product Processor Tables [main exposures]
  - From PP tables to FSI_CAP_INVESTMENT_EXPOSURES.
  - STG_UNDERLYING_EXPOSURES [Investment underlying exposures which are banking products and investment products]
  - From STG_UNDERLYING_EXPOSURES to FSI_CAP_BANKING_EXPOSURES.
- Banking Portfolio:
  - Product processor Tables [main exposures]
  - From PP tables to FSI_CAP_BANKING_EXPOSURES.

If the user chooses banking and investment portfolios together in a run, the data movement is as follows:

Banking				
MAIN EXPOSURE TYPE	**SOURCE**	**ULY EXPSOURE TYPE**	**TARGET**	**V_RECORD_TYPE**
BANKING	PP TABLES		FSI_CAP_BANKING_EXPOSURES	BNK_NON_SEC_EXP

Investments				
MAIN EXPOSURE TYPE	**SOURCE**	**ULY EXPSOURE TYPE**	**TARGET**	**V_RECORD_TYPE**
INVESTMENT	PP TABLES		FSI_CAP_INVESTMENT_EXPOSURES	INV_NON_SEC_EXP
INVESTMENT	STG_UNDERLYING_EXPOSURES	BANKING	FSI_CAP_BANKING_EXPOSURES	INV_NON_SEC_ULY
INVESTMENT	STG_UNDERLYING_EXPOSURES	INVESTMENT	FSI_CAP_INVESTMENT_EXPOSURES	INV_NON_SEC_ULY

When banking and investments both execute, the record type filter helps processing exposures as follows:

3. Banking Portfolio:

4. Only those exposures, which have record type as BNK_NON_SEC_EXP in FSI_CAP_BANKING_EXPOSURES.

5. Investment Portfolio:

   a. Exposures, which have record type as INV_NON_SEC_EXP and INV_NON_SEC_ULY in FSI_CAP_INVESTMENT_EXPOSURES.

   b. Exposures, which have record type as INV_NON_SEC_ULY in FSI_CAP_BANKING_EXPOSURES.

The steps to apply filters at Run and Business Pipeline levels are detailed in [OFS Analytical Applications Infrastructure User Guide](#).

12.2.1.3 Execution and Decision Rules

PMF has a capability to allow the flow of execution to follow a certain path while running a batch. The decision to include/exclude components in a user-defined run is based upon the Run Management Options. This allows the user to manage and report data for only those components, which the user has opted through the Basel Configuration > Run Management screen.

Based upon the selections made in the configuration screen, a table FSI_CAP_RUN_EXE_PAREMETERS is updated with the answers to the questionnaire.

A simple example can be of which portfolios the user has opted. If the user wishes to execute banking and investments only, then a Basel configuration is created through run management with this questionnaire. This configuration is selected during run execution.

12.2.1.4 Evaluation of Execution Rule

The questionnaire data is captured and pushed into the table FSI_CAP_RUN_EXE_PAREMETERS.

The execution rule 'Basel Execution Approach Assignment' reads the data from this table and assigns the values to respective PMF variables.

Figure 91: Evaluation of Execution Rule
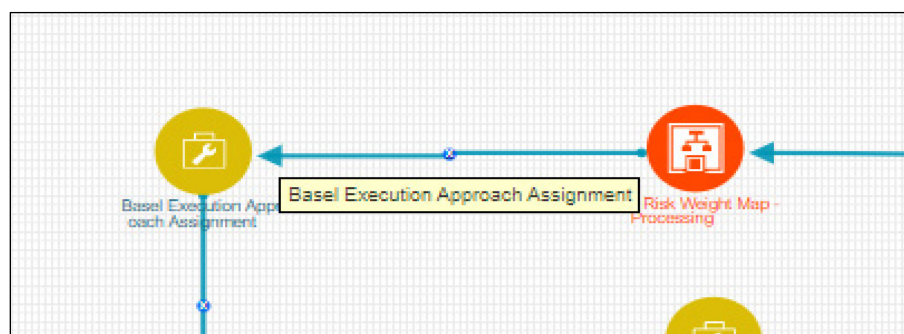
Figure 92: Edit API Details

12.2.1.5 Evaluation of Decision Rule

The variables, values for which are assigned in the execution rule, are evaluated in the respective transition lines for each applicable component. If the value matches with expected value in the transition line, then that path is taken.

Figure 93: Evaluation of Decision Rule
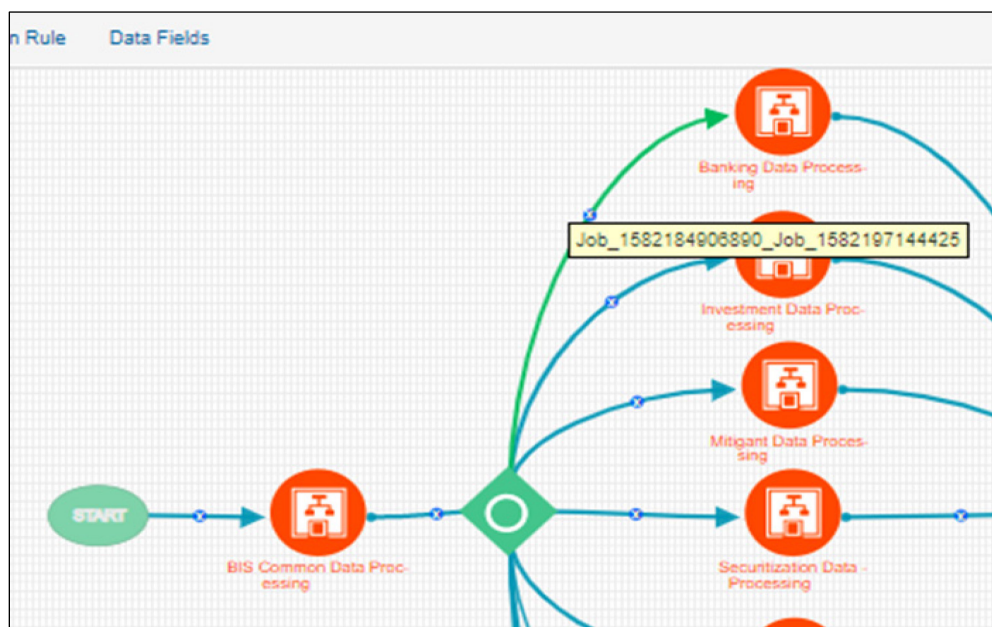
Figure 94: Edit Transition

12.2.1.6   Deprecation of Uncovered Record Creation DT and New Logic

The DT,Pop_Uncovered_Mitigant that creates uncovered exposure records in FCT_SUB_EXPOSURE table is deprecated and is replaced with three T2Ts as mentioned as follows:

For the effective optimization of the mitigants, the application used to create a replica of the exposures, with the standard mitigant type as Uncovered. This used to happen with the DT POP_UNCOVERED_MITIGANT.

To handle the revised data flow of processing, this is replaced by three T2Ts as follows:

T2T_FSI_CAP_NET_POOL_UNCOV_SUB_EXPOSURES

This T2T creates and inserts one uncovered exposure in FSI_CAP_SUB_EXPOSURES for each nettable pool account from FSI_CAP_NETTABLE_POOL.

SUB_EXPOSURES_BANKING_UNCOV_DATA_POP

This T2T creates and inserts one uncovered exposure in FSI_CAP_SUB_EXPOSURES for each exposure from FSI_CAP_BANKING_EXPOSURES.

SUB_EXPOSURES_INVESTMENT_UNCOV_DATA_POP

This T2T creates and inserts one uncovered exposure in FSI_CAP_SUB_EXPOSURES for each exposure from FSI_CAP_INVESTMENT_EXPOSURES.

12.2.1.7 Reuse of PMF Process for Underlying or Placed Collateral Data Processing

Investment portfolio requires banking and derivative underlying for its processing and calculations apart from investment exposures.

The banking and derivative underlying exposures must get the respective portfolio treatment (Risk weighting, AD and so on) while being processed under investment portfolio.

To achieve the above, investment portfolio pipeline calls banking portfolio and derivative portfolio pipeline to process the respective underlying and then use the processed or calculated attributes of these underlying to complete investment processing.

Hence investment portfolio reuses the complete Banking and Derivative pipeline (PMF process).

These pipelines are called only for the respective underlying by applying proper process filter on record type for underlying. The record type values can be found in FSI_CAP_RECORD_TYPE_MASTER. The process filter will allow only underlying records to be processed when called from the investment pipeline.

The record type process filter used are as follows:

- BNK_NON_SEC_ULY in Banking pipeline.

- DRV_NON_SEC_ULY in Derivative pipeline

Securitization Portfolio calls Banking portfolio pipeline from within to process non securitized banking underlying exposures which are part of securitized pool and are required for overall processing of the securitization portfolio. The banking pipeline is called with appropriate record type process filter to process only banking underlying exposures.

The record type process filter used is BNK_SEC_ULY in Banking pipeline.

Derivative portfolio and SFT portfolio pipelines call Mitigant pipeline from within to provide mitigant treatment (eligibility, mitigant risk weight and haircut) to their placed collaterals. The mitigant pipeline is called with appropriate record type process filter to process only placed collaterals.

The record type process filter used are follows:

- OTH_PLACED_COLL_EXP in Mitigant pipeline called in Derivative portfolio pipeline.

- SFT_PLACED_COLL_EXP in Mitigant pipeline called in SFT portfolio pipeline.

12.3 Run Parameters Setup for Creating a Run

If the run definition has not been created through the **Run Management** UI, then the **USER_DEFINED_RUN_PARAMETERS** table must be set up manually for the selected options/approaches for particular regulation and segment. This table contains the setup codes for different options. However, if you want to add more options, then you can add a record (new setup codes with options) by using information from the **RM_SETUP_APPROACH_DETAIL** table. In this table, the column names are populated against the questions. The column names and values that are updated for the selected option are given in the following tables:

Regulation: SAMA Basel III

Segment: BIS

Table 23: The values for the BASEL III regulation with the segment as BIS with the Approach as Securitization

RUN_PARAMETERS column name	Approach for Securitization	Selected Option	RUN_PARAMETERS column value
v_sec_approach	Standardized	N/A	OPT0500
v_sec_approach	Rating Based Approach	N/A	OPT0601
v_sec_approach	Internal Assessment Approach	N/A	OPT0604
v_sec_approach	Internal Rating Based Approach	N/A	OPT0608
v_ssf_simple_n_lgd	Supervisory Formula Approach	Yes	OPT0611
	Usage of the Simplified Method for computing N and LGD	No	OPT0612
v_ssf_simple_n_lgd	Internal Rating Based Approach	Yes	OPT0614
	Usage of the Simplified Method for computing N and LGD	No	OPT0615

Table 24: The values for the BASEL III regulation with the segment as BIS with the Approach as Market Risk Standardized Approach

RUN_PARAMETERS column name	Approach for Market Risk Standardized Approach	Selected Option	RUN_PARAMETERS column value
v_mrs_options_method	Options	Simplified Approach	OPT1013
		Delta Plus Approach	OPT1014
v_mrs_interest_rate_method	Interest Rate Risk	General Market Risk-Duration Method	OPT1003
		General Market Risk-Maturity Method	OPT1004
v_mrs_commodity_risk_method	Commodity Risk	Simplified Approach	OPT1008

Table 25: The values for the BASEL III regulation with the segment as BIS with the Approach as Non-Securitization Standardized

RUN_PARAMETERS column name	Approach for Non Securitization Standardized	Selected Option	RUN_PARAMETERS column value
v_nss_eca_for_sovereign	Use ECA Country Scores for risk-weighting claims on Sovereign	Yes	OPT0004
		No	OPT0005

RUN_PARAMETERS column name	Approach for Non Securitization Standardized	Selected Option	RUN_PARAMETERS column value
v_nss_rw_option_dpse	Option used for claims on domestic PSEs	Option II	OPT0009
v_nss_rw_option_bank	Option for risk-weighting claims on Banks	Option II	OPT0013
v_nss_lower_rw_cre	Has the national supervisor permitted a lower RW for certain commercial real estate?	Yes	OPT0020
		No	OPT0021
v_nss_pastdue_for_nonpastdue	Past due treatment for non-past due loans to counterparties subject to a 150% RW	No	OPT0025
v_nss_0_rw_for_gold	Use of 0% RW for Gold Bullion held in own vaults or on an allocated basis	Yes	OPT0027
		No	OPT0028
v_nss_borrower_ccy_rat_mdb	Use of borrower's domestic currency rating for exposure in foreign exchange transactions	Yes	OPT0030
		No	OPT0031
v_ns_sft_method	Approach for Securities Financing Transactions	Simple Approach	OPT0037
		IMM	OPT0038
		VaR Model	OPT0039
v_ns_otc_method	Approach for Over the Counter Products	CEM	OPT0041
		IMM	OPT0042
		Standard Approach	OPT0043
v_ns_lst_approach	Approach for Long Settlement Transactions	CEM	OPT0045
		IMM	OPT0046
		Standard Approach	OPT0047
v_ns_haircut_method	Applying Haircut	Supervisory Haircut	OPT0056
		Own Estimate	OPT0057
v_cva_method	CVA Standardized Approach	N/A	OPT0060
v_cva_include_sft	CVA Standardized Approach which includes SFTs for CVA calculation	Yes	OPT0062
		No	OPT0063
V_EXP_ADJ_PROVISIONS	Applicable for both STD and IRB approaches	Yes	OPTLE0003
		No	OPTLE0004

RUN_PARAMETERS column name	Approach for Non Securitization Standardized	Selected Option	RUN_PARAMETERS column value
V_PARAMETER_GROUP_DESC	Large Exposure Calculations	Yes	OPTLE0003
		No	OPTLE0004
V_PARAMETER_DESC	Option to consider Provision Amount for EAD Calculations	Yes	OPTLE0003
		No	OPTLE0004

12.4 Data Transformation Details for Portfolio or Module

This section lists the Data Transformation (DT) details for each Portfolio or Module.

See Oracle Financial Services Basel Data Transformation Details document for more details.

12.4.1 DT Details - Banking

DT TASK NAME	PROCESS CODE	PROCESS NAME
Bnk_Map_Ret_Exp	PMFBNK006	BNK_REGULATORY_RETAIL_PORTFOLIO
Bnk_Unrated_Exp_RW_Rat_Asses	PMFBNK013	BNK_ISSUE_ISSUER_ASSESSMENT
Bnk_Issue_Issuer_Assessment	PMFBNK013	BNK_ISSUE_ISSUER_ASSESSMENT

12.4.2 DT Details - Investment

DT TASK NAME	PROCESS CODE	PROCESS NAME
Inv_Ind_Mat_Chk_CE_CR_STD	PMFINV011	INV_PRE_CRM_EAD_COMPUTATION_STD
Inv_Unrated_Exp_RW_Rat_Asse	PMFINV017	INV_INV_ISSUE_ISSUER_ASSESSMENT
Inv_Issue_Issuer_Assessment	PMFINV017	INV_INV_ISSUE_ISSUER_ASSESSMENT

12.4.3 DT Details - Derivative

DT TASK NAME	PROCESS CODE	PROCESS NAME
Drv_Unrated_Exp_RW_Rat_Asses	PMFDRV021	DRV_ISSUE_ISSUER_ASSESSMENT
Drv_Issue_Issuer_Assessment	PMFDRV021	DRV_ISSUE_ISSUER_ASSESSMENT
Drv_Mult_Assessment_SCP	PMFDRV043	SOLD_CREDIT_PROTECTION_DATA_PROCESSING
Drv_Mult_Assessment_SCP	PMFDRV056	SOLD_CREDIT_PROTECTION_DATA_PROCESSING_IR

12.4.4 DT Details - Secured Financial Transactions (SFT)

DT TASK NAME	PROCESS CODE	PROCESS NAME
Sft_Issue_Issuer_Assessment	PMFSFT013	SFT_ISSUE_ISSUER_ASSESSMENT
Sft_Unrated_Exp_RW_Rat_Asses	PMFSFT013	SFT_ISSUE_ISSUER_ASSESSMENT
LR_SFT_Add_On_Amount	PMFSFT055	SFT_LEVERAGE_RATIO_COMPUTATIONS

12.4.5 DT Details - Securitization

DT TASK NAME	PROCESS CODE	PROCESS NAME
Sec_Pool_Param_Assignmnt	PMFSEC002	SEC_POOL_PARAMETER_ASSIGNMENT
Sec_Exp_Cr_Enhs	PMFSEC005	SEC_TRANCHE_CREDIT_ENHANCEMENT_CALCULAT
Subrdntd_Fndd_Amt_Pop	PMFSEC005	SEC_TRANCHE_CREDIT_ENHANCEMENT_CALCULAT
Upd_Pool_Trnch_Param_Exp	PMFSEC008	SEC_POOL_TRANCHE_PARAMETERS_UPDATE_EXPO
Mult_Assessment_Tranche	PMFSEC012	SEC_MULTIPLE_ASSESSMENT
Multiple_Assessment_Sec	PMFSEC012	SEC_MULTIPLE_ASSESSMENT
Avg_Exs_Sprd	PMFSEC014	SEC_INTERPOLATED_RISK_WEIGHT_AND_AVG_EXS_
Sec_Interpolated_RW	PMFSEC014	SEC_INTERPOLATED_RISK_WEIGHT_AND_AVG_EXS_
Get_Net_Over_Lap_Amt	PMFSEC017	SEC_PRE_CRM_EAD_CALCULATIONS
Resecuritized_Straddling_Sfa	PMFSEC020	SEC_STRADDLING_TRANCHES_PROCESSING
Upd_Pool_Trnch_Param_Exp	PMFSEC025	RESEC_POOL_AND_TRANCHE_PARAMETER_CALCUL
Resecuritized_Straddling_Sfa	PMFSEC026	RESEC_STRADDLING_TRANCHES_PROCESSING
Securitized_Pool_Gran_Cal	PMFSEC051	SEC_POOL_GRANULAR_CALCULATION

12.4.6 DT Details - Market Risk

DT TASK NAME	PROCESS CODE	PROCESS NAME
PC_Cap_Floor	PMFMR0021	Position Conversion Exotic Options
Mkt_Risk_Exp_Creation	PMFMR0021	Position Conversion Exotic Options
Mkt_Risk_Exp_Creation	PMFMR0022	Position Conversion Options
Mkt_Risk_Exp_Creation	PMFMR0023	Position Conversion Basket Futures - Interest Rate
MR_IR_Pos_Offset	PMFMR0024	Market Risk Position Offset
Ind_Mat_Lvl_Chk_CE_MR	PMFMR0024	Market Risk Position Offset
Mkt_Risk_Exp_Creation	PMFMR0025	Position Conversion Swaps
Mkt_Risk_Exp_Creation	PMFMR0027	Position Conversion Hybrid Instruments
Upd_Sp_RW_RM_Time_Band	PMFMR0028	Mkt Risk Specific Risk IR Assignment

DT TASK NAME	PROCESS CODE	PROCESS NAME
Mkt_Risk_CD_Hedging	PMFMR002A	Market Risk Credit Derivatives Offsetting
Mkt_Risk_Exp_Creation	PMFMR002B	Position Conversion Credit Derivatives
PC_Bskt_CDS	PMFMR002B	Position Conversion Credit Derivatives
Mkt_Risk_Exp_Creation	PMFMR0031	Market Risk Depository Receipts
Equity_NonDrv_Offsetting	PMFMR0034	Market Risk Equity Offsetting
Multiple_Assessment_MR	PMFMR0036	Market Risk Sec Specific Risk Charge Calculation
Mr_Sec_IRB_Min_SRC	PMFMR0036	Market Risk Sec Specific Risk Charge Calculation
Mkt_Risk_GenRsk_Comdty	PMFMR003D	Market Risk Generic Risk Charge Calculation Commod Maturity Approach
Mkt_Risk_GenRsk_IR	PMFMR003E	Market Risk Generic Risk Charge Calculation - IR and E
Mkt_Risk_Cap_Chrge_Forex	PMFMR003K	Market Risk Capital Risk Charge Calculation
MR_Var_sVar_IRC_CRM_Avg	PMFMR0045	Market Risk Var sVar IRC CRM Avg Calculation

12.4.7   DT Details - Operational Risk

DT TASK NAME	PROCESS CODE	PROCESS NAME
Opr_Risk_Capital_Charge	PMFBISOR002	Operational Risk-Basic Indicator Approach
OR_Capital_Std_App	PMFBISOR003	Operational Risk Alternative Std Approach

12.4.8   DT Details - Capital Structure

DT TASK NAME	PROCESS CODE	PROCESS NAME
Deduction_RWA_Cap_Struct	PMFBISCS022	CAPITAL_STRUCTURE_DEDUCTIONS_RWA_EXPOSUI

12.5   Implementing Basel

12.5.1   Rules List for Configuration

The list of rules which customer needs to reconfigure at their site are as follows.

Functionality	Reclassification Rule Name
Capital Structure	Capital Accounting Head To Standard Accounting Head Reclassification
Capital Structure	GL Account To Standard Accounting Head Reclassification
Capital Structure	Capital Consolidation Basel Entity Type Reclassification

Functionality	Reclassification Rule Name
Common	Basel III Capital Consolidation Approach Type Reclassification for an Entity
Common	Basel III Instrument Type Reclassification
Common	Credit Rating Reclassification
Common	Party Type Reclassification - STD
Common	Seniority Reclassification
Common	Mitigant Type To Standard Mitigant Reclassification
Common	Bank Role To Basel Bank Role Reclassification
Common	Account Purpose Reclassification
Common	EU - Cap Consl Basel Entity Type Reclassification
Common	BIS - Basel Party Type Classification
Credit Risk - Securitization	Bank Pool Type To Basel Pool Type Reclassification
Credit Risk - Non-Securitization	Basel III Equity Product Type Reclassification - STD
Credit Risk - Non Securitization	Basel Product Type Reclassification
Credit Risk - Non-Securitization	Non-Sec Basel II Product Type Reclassification - STD
Credit Risk - Non Securitization	Fixed Assets to Basel Product Type Reclassification
Credit Risk - Non Securitization	Guarantee Scheme To Regulatory Guarantee Scheme Reclassification
Counterparty Credit Risk	Netting Agreement Mitigant Type Reclassification - SA - CCR
Counterparty Credit Risk, Market Risk	Basel III Instrument Type Reclassification
Credit Risk - Securitization	Basel III Sec Product Type Reclassification - STD
FRTB	Commodity Type Classification
Market Risk	MR PC Instrument Type Reclassification - Convertible Bond
Market Risk	MR PC Instrument Type Reclassification - Credit Derivatives
Market Risk	MR PC Instrument Type Reclassification - Exotic Instruments
Market Risk	MR PC Instrument Type Reclassification - Forwards and Futures
Market Risk	MR PC Instrument Type Reclassification - Hybrid Instruments
Market Risk	MR PC Instrument Type Reclassification - Options
Market Risk	MR PC Instrument Type Reclassification - Swaps
Operational Risk	OR Internal LoB to Standard LoB Reclassification
Large Exposures	Party Relationship Type Reclassification

12.5.2   Custom Reclassification Rules

See Configure Rule with Target Members for more information on Custom Reclassification Rules.

12.5.3   Seeded Values Used

To view the seeded values for the following Seeded tables, see Seeded_Tables_Data_1 and Seeded_Tables_Data_2.

- DIM_BANDS
- DIM_BASEL_ASSET_CLASS
- DIM_BASEL_BANK_ROLE
- DIM_BASEL_CAP_CONSL_APPR
- DIM_BASEL_CONSL_OPTION_TYPE
- DIM_BASEL_CREDIT_RATING
- DIM_BASEL_EXPOSURE_CLASS
- DIM_BASEL_ISSUER_TYPE
- DIM_BASEL_METHODOLOGY
- DIM_BASEL_POOL_TYPE
- DIM_BASEL_PRODUCT_TYPE
- DIM_BASEL_TRANSACTION_TYPE
- DIM_CAPITAL_COMP_GROUP
- DIM_CLEARED_TXN_BANK_ROLE
- DIM_COUNTRY
- DIM_CREDIT_RATING
- DIM_CREDIT_STATUS
- DIM_CURRENCY
- DIM_EXPOSURE_UNDERLYING_TYPE
- DIM_GAAP
- DIM_INSTRUMENT_TYPE
- DIM_INTEREST_TYPE
- DIM_MARKET_RISK_CHARGE_TYPE
- DIM_MARKET_RISK_POSITION
- DIM_MARKET_RISK_REP_LINE
- DIM_METHODOLOGIES
- DIM_MITIGANT_TREATMENT_TYPE
- DIM_MR_ASSET_CLASS
- DIM_MR_COUNTER_PARTY

- DIM_MR_RISK_CLASS

- DIM_MR_TIME_VERTEX

- DIM_PRODUCT_BOOK

- DIM_REG_CAP_ACCT_PURPOSE

- DIM_REG_CAP_EXEMPTION_CRITERIA

- DIM_REG_CAP_GUARANTEE_SCHEME

- DIM_REG_PARTY_RELATIONSHP_TYPE

- DIM_RISK_TYPE

- DIM_RUN_TYPE

- DIM_SEC_FACILITY_TYPE

- DIM_SECURITIZATION_TYPE

- DIM_STANDARD_ACCT_HEAD

- DIM_STANDARD_COMMODITY

- DIM_STANDARD_COMMODITY_GRADE

- DIM_STANDARD_EVENT_TYPE

- DIM_STANDARD_LOB

- DIM_STANDARD_PARTY_TYPE

- DIM_STANDARD_SENIORITY

- DIM_STD_MITIGANT_TYPE

- REVELEUS_PARAMETER_MASTER

12.6 Basel Analytics Table Population - Reporting T2T

This section provides information on the target and the granularity of tables.

12.6.1 Credit Risk and Counterparty Credit Risk – Non-Securitization

12.6.1.1 Exposure Level Granularity

T2T Name	Description
Account Level Information T2T	These T2T take inputs from different portfolio table (FSI Cap Banking Exposures (FSI_CAP_BANKING_EXPOSURES), FSI Cap Investment Exposures (FSI_CAP_INVESTMENT_EXPOSURES), FSI Cap Derivative Exposures (FSI_CAP_DERIVATIVES), and FSI Cap Securities and Financing transactions (FSI_CAP_SFT_EXPOSURES) and populate Fact Regulatory Capital Account Summary (FCT_REG_CAP_ACCOUNT_SUMMARY)

T2T Name	Description
	• T2T_FRCAS_FSI_CAP_BANKING_EXPOSURES • T2T_FRCAS_FSI_CAP_INVESTMENT_EXPOSURES • T2T_FRCAS_FSI_CAP_DERIVATIVES • T2T_FRCAS_FSI_CAP_SFT_EXPOSURES
Assets Sold Information T2T	This T2T take inputs from FSI Cap Banking Exposures (FSI_CAP_BANKING_EXPOSURES) and populate Fact Regulatory Capital Assets Sold Summary (FCT _REG_CAP_ASSET_SOLD_SUMMARY) • T2T_FCT_REG_CAP_ASSET_SOLD_SUMMARY
Credit Line Information T2T	This T2T populate from FSI Cap Banking Exposures (FSI_CAP_BANKING_EXPOSURES) to Fact Regulatory Capital Credit Line Summary (FCT_REG_CAP_CREDIT_LINE_SUMMRY). • T2T_FCT_REG_CAP_CREDIT_LINE_SUMMRY
Fixed Asset Level Information T2T	This T2T populate from FSI Cap Investment Exposures (FSI_CAP_INVESTMENT_EXPOSURES) to Fact Regulatory Capital Fixed Asset Summary (FCT_REG_CAP_FIXED_ASST_SUMMARY). • T2T_FCT_REG_CAP_FIXED_ASST_SUMMARY

12.6.1.2 Placed Collateral Level Granularity

T2T Name	Description
Placed Collateral Information T2T	This T2T populate Fact Regulatory Capital Placed Collateral Summary FCT_REG_CAP_PLCD_COLL_SUMMARY) from FSI Placed Collateral (FSI_PLACED_COLLATERAL) • T2T_FCT_REG_CAP_PLCD_COLL_SUMMARY

12.6.1.3 Counterparty Level Granularity

T2T Name	Description
Counterparty Level Granularity	These T2T take inputs from Fact Counterparty Details (FCT_CCP_DETAILS), and Fact Counterparty Exposure (FCT_COUNTERPARTY_EXPOSURE) and populate Fact Regulatory Counterparty Capital Summary (FCT_REG_CP_CAPITAL_SUMMARY). • T2T_FRCCS_FCT_CCP_DETAILS • T2T_FCT_REG_CP_CAPITAL_SUMMARY
Large Exposure Limits T2T	These T2T take inputs from Fact Party Group Large Exposure (FCT_PARTY_GROUP_LARGE_EXPOSURE) and populate Fact Regulatory Large Exposure Counterparty Limits (FCT_REG_LARGE_EXP_CP_LIMITS). • T2T_FCT_REG_LARGE_EXP_CP_LIMITS

12.6.1.4 Pool Level Granularity

T2T Name	Description
Pool Level Granularity	This T2T take inputs from FSI Cap Nettable Pool (FSI_CAP_NETTABLE_POOL) and populate Fact Regulatory Capital Pool Summary (FCT_REG_CAP_POOL_SUMMARY). • T2T_FCT_REG_CAP_POOL_SUMMARY

12.6.1.5 Pool and Mitigant Level Granularity

T2T Name	Description
Account Mitigant Level Information T2T	This T2T take inputs from FSI Cap Exposure Mitigant Mapping (FSI_CAP_EXP_MITIGANT_MAPPING) and populate Fact Regulatory Pool Mitigant Mapping (FCT_REG_POOL_MITIGANT_MAP) • T2T_FRPMM_FSI_CAP_SUB_EXPOSURES

12.6.2 Credit Risk – Securitization

12.6.2.1 Pool Level Granularity

T2T Name	Description
Securitization Pool Level Information T2T	Below T2T take input from Fact Securitization Pool (FCT_SECURITIZATION_POOL) and populate Fact Regulatory Securitization Pool Summary (FCT_REG_SEC_POOL_SUMMARY) • T2T_FCT_REG_SEC_POOL_SUMMARY

12.6.2.2 Exposure Level Granularity

T2T Name	Description
Account Level Information T2T	These T2T take inputs from FSI Sub Exposures (FSI_CAP_SUB_EXPOSURES) and populate FSI Basel Exposures Post Crm (FSI_CAP_EXPOSURES_POST_CRM) • T2T_FSI_CAP_EXPOSURES_POST_CRM

12.6.3 Common Mitigant Flow

12.6.3.1 Mitigant Level Granularity

T2T Name	Description
Mitigant Level Information T2T	Below T2T take input from FSI Cap Mitigants (FSI_CAP_MITIGANTS) and populate Fact Mitigant Regulatory Capital table (FCT_MITIGANT_REG_CAPITAL)

T2T Name	Description
	• T2T_FMRC_FSI_CAP_MITIGANTS

12.6.3.2 Mitigant and Account Granularity

T2T Name	Description
Account Mitigant Level InformationT2T	These T2T populate Fact Regulatory Account Mitigant Mapping (FCT_REG_ACCT_MITIGANT_MAPPING) • T2T_FRAMM_NET_POOL_EXP_MITIGANT_MAP • T2T_FRAMM_FSI_CAP_SUB_EXPOSURES

12.6.4 Operational risk

T2T Name	Description
Operational Risk Level information T2T	Below T2T take input from Fact Operational Risk Data (FCT_OPS_RISK_DATA) and populate Fact Regulatory Operational Risk Capital Summary (FCT_REG_OR_CAPITAL_SUMMARY) • T2T_FCT_REG_OR_CAPITAL_SUMMARY

12.6.5 Entity Level Capital Accounting Head Granularity

T2T Name	Description
Entity Level Information T2T	These T2T take inputs from Fact Standard Accounting Head (FCT_STANDARD_ACCT_HEAD) and populate Fact Regulatory Legal Entity(FCT_REG_LE_CAPITAL_SUMMARY) • T2T_FCT_REG_LE_CAPITAL_SUMMARY

12.7 Basel Analytics Table Population - Processing T2T

These T2T are used to populate tables used for dashboard reporting. This is to ensure data is being brought into the single processing layer, to ensure streamlined reporting, instead of individual portfolio level reporting tables.

T2T Name	Description
Mitigant Level Information T2T	This T2T take inputs from FSI Mitigants table (FSI_CAP_MITIGANTS) and populate FCT Mitigants table (FCT_MITIGANTS) • T2T_MITIGANTS_FSI_CAP_MITIGANT
Account Level Information T2T	These T2T take inputs from different portfolio table (FSI Cap Banking Exposures (FSI_CAP_BANKING_EXPOSURES), FSI Cap Investment Exposures (FSI_CAP_INVESTMENT_EXPOSURES), FSI Cap Derivative Exposures (FSI_CAP_DERIVATIVES), and FSI Cap

T2T Name	Description
	Securities and Financing transactions (FSI_CAP_SFT_EXPOSURES) and populate Fact Non Sec Exposures (FCT_NON_SEC_EXPOSURES) • T2T_NON_SEC_FSI_CAP_BANKING_EXPOSURES • T2T_NON_SEC_FSI_CAP_DERIVATIVES • T2T_NON_SEC_FSI_CAP_INVESTMENT_EXPOSURES • T2T_NON_SEC_FSI_CAP_SFT_EXPOSURES
Pool Level Information T2T	This T2T take inputs from FSI Nettable Pool table (FSI_CAP_NETTABLE_POOL) and populate FCT Nettable Pool (FCT_NETTABLE_POOL) • T2T_NETTABLE_POOL_FCT_NETTABLE_POOL
Account and Mitigant Level Information T2T	This T2T take inputs from FSI Sub Exposures table (FSI_CAP_SUB_EXPOSURES) and populate Fact Sub Exposures (FCT_SUB_EXPOSURES) • T2T_SUB_EXPOSURES_FCT_SUB_EXPOSURES

13   Annexure C: Frequently Asked Questions

This section addresses some of the frequently asked questions which are as follows:

13.1   Leverage Ratio

Does the application require a different set of input data to execute the Leverage Ratio?

No. Leverage Ratio can be executed on the same set of input data required for normal processing to execute the Basel III Run. The input for leverage ratio is the subset of the data provided for Basel III executions. However, an additional set of data is required (total consolidated asset) for accounting entity which is outside the scope of the consolidation process. As per the Basel III Accord, total consolidated asset value must add up to the Total Exposure Measure calculation for Leverage Ratio.

Can we execute Leverage Ratio if the bank has installed the application for the first time?

Yes, we can compute Leverage Ratio. The application calculates the current month Leverage Ratio and the Leverage Ratio of the previous two months, which is provided as a download by the client or the bank. This information is considered as an input to calculate Regulatory Leverage Ratio. If the previous month's data is not available, then the application considers the value as 0 and computes the Regulatory Leverage Ratio. Also, you have the flexibility to use the current month Leverage Ratio as input for previous two months' leverage ratio, if required.

Can Leverage ratio be calculated on any day during a particular month?

There is no restriction on the execution date for computing Leverage Ratio. Leverage Ratio can be calculated on any given day. However, Leverage Ratio is to be executed based on the month-end data.

As per Basel III requirement, the Leverage Ratio is to be calculated on Tier 1 capital. However, if a particular jurisdiction prescribes to calculate the Leverage Ratio based on Total capital, then can the application support such modifications?

Yes, the application has the flexibility to change the input criteria by adding or deleting the Rule related to capital. To achieve this, modify the Business Processor's BP-Leverage Ratio expression by modifying one of the used measures. Instead of measure CS Net Tier1 capital, add another measure created on Total capital by deleting the existing one. The data model is not affected by such changes.

13.2   Capital Buffers

As per the Basel III Accord, Capital Buffers are required to be maintained from 2016 only. However, if for internal purposes the bank wants to start computing it from 2013 itself, then does the application support such modifications? If yes, then will it consider the required capital ratios as per the transitional arrangement?

Yes, the application supports the calculation of capital buffers from 2013 and it considers the transitional arrangement for the calculations before 2016.

For Example: The application considers the required Tier 1 Ratio in 2013 as 4.5%. For this calculation, no changes are required in the input data as the calculation in the application begins from 2013.

Likewise, the application selects the required values for CET1, Tier 1, and CAR as per the transitional arrangements for years 2013, 2014 and 2015.

While building quartiles, how much Required CET1 is considered for computing Capital Conservation Ratio?

Required CET1 ratio is used for computing the four quartiles or intervals for Capital Conservation Ratio. Since Required CET1 is phased out through a transitional arrangement, the value used in the calculation of quartiles is a maximum of 4.5% or the CET1 required by that specific jurisdiction in that specific year.

The computed value for Available Buffer from CET1 capital is considered for all three buffers. Is there any priority of one buffer over the other?

As per the Basel III Accord, there is no priority given to one buffer over the other. Required Buffer from CET1 capital is compared against the Available Buffer from CET1 capital. Any shortfall or excess is reported at an aggregate level. It cannot be reported for one specific type of buffer. This approach in the application is built as per our interpretation of the Basel guidelines. As per the Basel III Accord, the other two buffers are met through an extension of Capital Conservation Buffer and the accord does not explicitly mention about its priority. The Capital Conservation Ratio for a shortfall is also calculated at an aggregate level and not at individual buffer level.

Can the regulator of the parent jurisdiction prescribe countercyclical buffer requirement different from the one prescribed by the home country's regulator to which the exposure relates to?

As per our interpretation of the Basel III accord, the countercyclical buffer requirements can be different. By default, the requirement that is prescribed by the parent regulator must be used as input data which in turn is used for further calculations.

If one of the exposure countries has not implemented Basel III and the country's regulator have not recommended any buffer, must countercyclical buffer requirement be taken as 0% for the exposures of that country?

No, the countercyclical buffer requirement cannot be taken as 0% as the parent company's regulator has exposure to this country. For a consolidated Run, it depends on the buffer requirement required for all the exposure countries by the parent regulator.

By default, the buffer requirement specified by the parent regulator for each exposure country is included in the input data. Therefore, data is not required to be modified.

As per Basel requirements, all three buffers are calculated from CET1. However, in the future as per guidelines of the Basel Committee on banking supervision, it may be required to be calculated from Tier 1 or CAR. Does the application have a provision for that?

Yes. The application is flexible to compute such changes. It can be modified to compute buffer from Tier 1 capital and CAR. The logic for computing this buffer is similar to the one used for buffer from CET1 capital. The application can calculate buffers form Tier 1 capital, by taking remainder of following:

Excess of Tier1 Capital Ratio over benchmark (6.0 %), after catering to the shortfall, if any, in Tier 2 capital to its respective benchmark level, which is 2%, minus Required Benchmark Buffer from CET1 capital. Hence, Capital Conservation Buffer excludes any additional CET1 needed to 8% Total Capital Ratio.

To calculate buffer form Total Capital, remainder of following is taken:

Excess of Total Capital Ratio over benchmark (8.0%), minus Required Benchmark Buffer from Tier 1 capital.

13.3 Credit Valuation Adjustment

How will the application handle Index Decomposition, if data for index is not provided and index decomposition is selected?

In this case, the application calculates CVA charge without decomposition. The Run can be successfully executed and Index Hedge position is treated without decomposition.

How does the application handle an Index Hedge position marked to the counterparty wherein multiple counterparties which are part of Index and Index decomposition are selected?

The application creates a single name CDS hedge for all the counterparties with which the bank has exposures and is a part of the index. Index position mapped to a counterparty is used only to allocate CVA charge to the counterparty while using Standardized Approach for CVA calculation.

Can IMM approach be selected for Capital Conservation Ratio calculation and standardized approach for CVA Calculation?

No, IMM approach cannot be selected for Capital Conservation Ratio. The application requires CEM method output for computing CVA Charge using Standardized approach.

Can the discount factor be changed which is currently proposed as 5% as per the Basel guideline?

Yes, risk free rate can be changed by modifying Rules. For more information on modifying Rules, see **Error! Reference source not found.**.

How is CVA RWA used in the application?

The application calculates CVA RWA and sums it to Credit RWA. CVA RWA is not multiplied by the factor 1.06.

Will the application create a duplicate hedge record from Index Decomposition, if the Run is executed twice?

No, the application does not create a duplicate hedge record. The application checks whether the record already exists and it uses the same. If the record does not exist, then the application creates a hedge record.

13.4 Operational Risk

If the input parameter to calculate the Annual Gross Income is different for other jurisdictions, then can the input parameters be changed?

Yes, you can change the input parameters by adding or deleting the Rule related to Annual Gross Income. To achieve this, modify the BP expression - Ops Risk Annual Gross Income by adding the newly defined measure or deleting the used measure. The data model can undergo changes if the newly added parameter is not captured. The data model changes affect the staging table and the processing table.

Can reclassification rule for mapping of internal LOB to standard LOB be modified?

Yes, you can change Reclassification Rule as per jurisdiction requirement. You must add the mapping in the Rule OR Internal LOB to Standard LOB Reclassification and make an entry into DIM_LOB and DIM_STANDARD_LOB.

13.5　Capital Structure (Basel III)

Are the list of instruments provided for each component of capital that is, CET1, AT1, and T2 fixed or can the list of instrument be extended or reduced to accommodate as per the requirement?

The list of instruments mapped to different components of capital is a bare minimum list. You can add or delete as per their definition of capital by adding or deleting a mapping in the Rule – Non-Sec Standard Product type to capital Comp Group Reclassification for banking book (non securitization) exposures and in Rule – Mkt Risk Instrument type to Capital Comp Group Reclassification for trading book exposures. No data model changes are required.

The criteria to calculate the surplus capital in CET1 for Minority Interest is Minimum CET1 plus the Capital Conservation Buffer. If the criteria changes in the future to include the countercyclical buffer along with CET1 and CCB, then can the application handle such modifications?

The application has the flexibility to include any parameter or delete any parameters to calculate the Minority Interest. In such a case, the Rule can be modified to include additional parameters or delete if required.

Is there any flexibility in the Rule to add or delete any regulatory adjustment line item during the calculation of CET1?

Yes, the application has the capability to add or delete any regulatory adjustment line item. This is handled in the Rule by adding or deleting any regulatory adjustment line item.

Considering that the phase-in treatment criteria specified as per the accord changes in the future where the deduction values and risk-weighting values change, then can this scenario be handled by the application without affecting other sections?

The application is flexible to accommodate any scenario for phase-in treatment. For example: if in the future the phase-in criteria changes from 20%, 40%,60%,80% to 25%, 45%,65%, 85%, then the application has the capability to change the value as well during the phase-in. The deduction amount that is not deducted is to be risk-weighted with some different percentage.

The values in the capital component column of the Setup Capital Heads (FSI_SETUP_CAPITAL_HEAD) must be changed to accommodate this phase-in treatment.

What if the Bank doesn't calculate CR RWA, MR RWA, and OR RWA and directly provides a value against each of this line item?

The application supports such direct download values for RWA in table – STG_STANDARD_ACCT_HEAD against appropriate Standard Account Head identifiers (CAP169 for Credit RWA, CAP090 for Market RWA, and CAP170 for Operational RWA).

13.6　Securitization

The Reporting Bank wants to implement the Securitization aspect of the Credit Risk. The Bank currently does not have the Credit Risk module. How can the Reporting Bank implement only the Securitization module?

If the bank wants to implement Securitization Standardized approach, then data relevant to the exposures, tranche, pool, rating, and mitigant details are expected. If the IRB approach is implemented, then the complete underlying exposure details are expected apart from the previous mentioned details.

The reporting bank has the underlying data and has provided the pool, tranche, and exposures data. Additionally, the reporting bank has also provided the pool and tranche information in the exposures table. In this case, will the application use the data from the pool and tranche table or from the exposures table?

The application expects the data only in either of the following tables:

Pool, tranche, and exposures table with all the pool, tranche, and exposures attribute data only in their respective tables.

Exposures table with the entire exposures attribute and few of the attributes of the pool and tranche.

The application gives a preference to the pool and tranche attributes in the exposures table, compared to the attributes given in the pool and tranche table. In this case, all the computations is based out of the data given in the exposures table.

How does the bank select particular Securitization approach?

As per regulator's guidelines, banks are expected to follow the hierarchy of approaches while implementing IRB approach as follows:

Supervisory Formula Approach (SFA)

Simplified Supervisory Formula Approach (SSFA)

Risk Weight at 1250%

The application supports this hierarchy of approaches. As stated in the accord, the SFA/SSFA approaches are data driven approaches and availability of data drives the approach selection. In case the bank has relevant data of underlying exposures that is required for SFA calculations, it needs to follow SFA approach. Most of banks that are originators and sponsors of deal have this data and some of the investor banks may have it and hence they naturally follow SFA. However, in case the bank does not have this underlying data, it cannot follow SFA approach; such banks can follow SSFA approach by providing parameters that are applicable only to SSFA as direct input to the application.

The reporting bank, who is an investor in securitization transaction, has an unrated securitization exposure. How will this unrated exposure be treated by the application?

The application treats the unrated exposure based on the approach being followed for that exposure. The approach followed is the same for the originator and the investor.

Standardized Approach

In this case, the application calculates the weighted average risk weight of the underlying exposures and assigns this to the exposure.

If the details regarding the underlying exposures are not available, then the unrated exposures are deducted.

Ratings Based Approach

In this case, the application tries to infer the rating based on the presence of the rated subordinate tranche information, belonging to the same pool.

The application tries to identify whether there are any rated subordinate tranche belonging to the same pool, and which has the credit enhancement level less than that of the unrated exposure and which has the residual maturity more than that of the unrated exposure and which has the seniority less than that of the unrated exposure. The seniority is a number denoting the seniority of the cash flows to that tranche and it starts from the value of 1 which is the senior most tranche.

If the ratings are inferred, then the application assigns the rating to the exposure and hence assigns the corresponding risk weight.

All other processing are the same as other rated exposures.

If the rating cannot be inferred, then the unrated exposures are deducted.

Supervisory Formula Approach

In this case, there is no dependency on the ratings. Hence, it proceeds without any difference in the treatment.

The reporting bank, which is an investor in Securitization Transaction, is provided protection on its securitization exposure with the help of an Nth to Default credit derivative mitigant. How will the application recognize the benefit for this exposure?

The application identifies the nth to default credit derivative protection based on the comparison of the tranche attachment point, initial pool amount, and the cumulative loss amount of the pool. Using this, the application calculates whether the tranche is in default or not. Further, the application counts the number of tranches in default and then compares this number with the defaulted position covered by the mitigant. Hence for this, the entire tranche information of the pool is required, regardless of whether the Bank has an exposure in all those tranches or not.

For example: the exposure held by the bank belongs to tranche T1 and this belongs to the pool P1. Assume that there are a total of 10 tranches being issued out of that pool. (T1 to T10). The mitigant provided is 7th to default credit derivative. Hence, the application recognizes this mitigant only if there are 6 defaults in the basket of exposures (T1 to T10) or else there is an eligible 6th to default credit derivative for the same pool. Assume that the following are the calculations:

The application takes the tranche attachment point and multiplies this with the initial pool amount. This amount is compared by the application with the cumulative loss of the pool. If the amount is less than or equal to the cumulative loss of the pool, then that tranche is in default. Further, the application takes the count of all the tranches which are in default. In the following case, there are 6 defaults in the exposures. This is compared with the defaulted position of the mitigant. Since there are n-1 defaults (7-1 = 6) in the exposure, the mitigant is recognized for this pool. The exposure with the least risk weight and highest seniority is allocated the mitigant and all other exposure combinations mapped to this mitigant iscome ineligible.

Tranche ID	Tranche Attachment Point	Associated Pool ID	Initial Pool Amount	Attachment * Pool	Cumulative Loss of the Pool	Defaulted?
T1	0.75	P1	1,000,000.00	750,000.00	300,000.00	N
T2	0.58	P1	1,000,000.00	580,000.00	300,000.00	N
T3	0.45	P1	1,000,000.00	450,000.00	300,000.00	N
T4	0.34	P1	1,000,000.00	340,000.00	300,000.00	N
T5	0.29	P1	1,000,000.00	290,000.00	300,000.00	Y
T6	0.22	P1	1,000,000.00	220,000.00	300,000.00	Y
T7	0.18	P1	1,000,000.00	180,000.00	300,000.00	Y
T8	0.15	P1	1,000,000.00	150,000.00	300,000.00	Y

Tranche ID	Tranche Attachment Point	Associated Pool ID	Initial Pool Amount	Attachment * Pool	Cumulative Loss of the Pool	Defaulted?
T9	0.05	P1	1,000,000.00	50,000.00	300,000.00	Y
T10	0	P1	1,000,000.00	-	300,000.00	Y

The Reporting Bank has multiple exposures mapped to multiple mitigants. How will the application allocate the mitigants to the exposures?

The application uses the optimizer to allocate the mitigants to the exposures. The optimizer constraints in the case of securitization are dependent on the seniority of the exposures, risk weight of the exposures, and the mitigant value assigned to the exposure post the haircut. Assume the following case of exposures and mitigants mapped to each other along with the seniority, risk weight, and the haircut factor.

Exposure ID	Exposure amount	Exposure Seniority	Exposure RW	Mitigant ID	Mitigant Amount	Mitigant RW	Haircut Factor
E1	5,000.00	1	0.5	M1	10,000.00	0.2	0.2
E2	3,000.00	2	0.5	M1	10,000.00	0.2	0.4
E3	2,000.00	2	0.5	M1	10,000.00	0.2	0.15
E4	1,500.00	3	1	M1	10,000.00	0.2	0.1
E1	5,000.00	1	0.5	M2	5,000.00	0	0.4
E2	3,000.00	2	0.5	M2	5,000.00	0	0.87
E3	2,000.00	2	0.5	M2	5,000.00	0	0.37
E4	1,500.00	3	1	M2	5,000.00	0	0.64
E1	5,000.00	1	0.5	M3	3,500.00	0.2	0.05
E2	3,000.00	2	0.5	M3	3,500.00	0.2	1
E3	2,000.00	2	0.5	M3	3,500.00	0.2	0.18
E4	1,500.00	3	1	M3	3,500.00	0.2	0.27

The mitigants are assigned to the exposures based on the seniority of the exposures. The mitigants with the least risk weight are assigned first to the exposures. The following is the order in which the mitigants are allocated.

Exposure ID	Mitigant ID
E1	M2
E2	M2
E3	M2
E4	M2

Exposure ID	Mitigant ID
E1	M1
E2	M1
E3	M1
E4	M1
E1	M3
E2	M3
E3	M3
E4	M3

The application assigns the exposures to the mitigants based on this order and computes the Post-CRM RWA of the exposures.

Does optimizer work on pool-by-pool basis? Can the user explicitly mention how many pools can be processed at a time?

Yes, the optimizer works on pool-by-pool basis. However, you can specify the number of pools to be processed at a single fand so onh in Optimizer_Config.xml in <PROCESSEDPOOLSIZE> tag.

Is it possible that few of the exposure-mitigant combination can have no pool ids? If so, what happens to those records?

All the records are expected to have pool IDs based on the exposure mitigant combination. If few records do not satisfy the join/filter condition present in pooling definition, then the pool IDs are not assigned. Such records are not considered for optimizer and covered factor is not calculated for those exposures.

13.7 Capital Structure (Basel II)

Are the list of instruments provided for each component of capital that is, T1, T2, and T3 fixed or can the list of instrument be extended or reduced to accommodate as per the requirement?

The list of instrument mapping to different components of capital is a bare minimum list. You can add or delete as per their definition of capital in the Rules – 'Bank capital Group Components Reclassification' and 'STD to Capital Group Components Reclassification'

Is there any flexibility in the Rule to add or delete any regulatory adjustment line item during the calculation of T1 and T2?

Yes, the application has the capability to add or delete any regulatory adjustment line item. This is handled in the rule by adding or deleting any regulatory adjustment line item.

What if the Bank does not calculate any of the CR RWA, MR RWA and OR RWA and directly provides a value against each of these line items?

The application supports and has taken into account for such direct download values for RWA in the table – STG_STANDARD_ACCT_HEAD against appropriate Standard Account Head identifiers (CAP169 for Credit RWA, CAP090 for Market RWA and CAP170 for Operational RWA) for entities for which the bank does not calculate RWA using our application.

13.8 Market Risk (Basel II)

Does the Greeks Engine calculate Greeks parameters for all kind of Options?

Currently, the Greeks Engine calculates parameters only for normal options. The exotic options are not covered by Greeks Engine.

13.9 Mitigant Eligibility (Basel III)

The Reporting Bank has a wholesale exposure and for that guarantee from an issuer is present which can be reclassified under the "Other Entities". The current rating of the guarantor is B-. How does the application handle this in Basel II and Basel III runs?

The application handles the mitigant eligibility of Basel II and Basel III using separate rules. The application using the Basel III Rule, checks for the presence of a rating for this kind of issuer type and if there is a rating available, then this mitigant becomes eligible. The application under the Basel II rule checks for the rating to be A- or better and if the rating is below A-, then this mitigant becomes ineligible.

13.10 Haircut Assignment (Basel III)

The Reporting Bank has a securitized exposure and for that two financial collaterals are present - a debt instrument from an issuer which can be reclassified under the "Non-Sovereign" issuer type and a debt instrument which is part of a securitization transaction. For the first instrument, the current ratings of the instrument by 2 agencies are AAA and A+ and its residual maturity is 4.5 years. For the second instrument which is a securitized debt exposure, the current rating of the instrument by 2 agencies are A and BBB+, and its residual maturity is 8 years. What is the volatility haircut applied for this mitigant by the application under Basel II and Basel III rules?

The application handles the volatility haircut assignment for debt securities of Basel II and Basel III using separate rules. The application requires a single rating for the debt securities. Since there are multiple ratings, the application applies multiple assessment and calculates the final current rating. In this case, the first mitigant is rated A+ and second mitigant is rated BBB+, post multiple assessment. The application under the Basel III rule checks for the current rating of the debt instrument, its residual maturity, whether the debt security is a securitized exposure or not, and the issuer of the debt security.

For the first mitigant, the current final rating is A+ and it is a debt security issued by a non-sovereign with a residual maturity of 4.5 years. The haircut assigned is 6%.

For the second mitigant, the current final rating is BBB+ and it is a debt security which is a securitized exposure with a residual maturity of 8 years, the haircut assigned is 24%.

The application using the Basel II Rule, checks the current rating of the debt instrument, its residual maturity, and the issuer of the debt security.

For the first mitigant, the current final rating is A+ and it is a debt security issued by a non-sovereign with a residual maturity of 4.5 years. The haircut assigned is 6%.

For the second mitigant, the current final rating is BBB+ and it is a debt security issued by a non-sovereign with a residual maturity of 8 years, the haircut assigned is 12%.

13.11   Cleared Transactions

What is the treatment for the transaction between clearing member and client which arises due to clearing member acting as intermediary for the transaction and reporting bank act as clearing member?

Currently the treatment assigned in the accord is of bilateral trade and application expects user not to identify the previous trades as cleared transaction.

Will the netting agreement be changed for cleared transaction?

No. Trade marked for the Netting agreement is the trading input and risk calculation does not change previous logic.

Since the each collateral is treated separately is there a chance that separate risk weight is assigned to different collateral?

No. Risk Weight assigns changes only when the reporting bank is clearing member client and have not posted the collateral and due diligence is not conducted. Application expects the previous condition to be uniform for all the collateral posted, that is, if collateral is cash and securities will either cover all losses or not cover all losses. Data consistency is expected from the user. Moreover the reporting bank to get the transaction cleared from CCP, previous two conditions are mandatory to meet, so the application expects very less trade to go with 4% risk weight.

Will the transaction with non-qualifying CCP have CVA Charge?

No. CVA charge is excluded for the transaction with CCP. Qualifying CCP transactions are given preferential treatment for RW and non-qualifying CCP is treated as bilateral trades. Both trades do not qualify for CVA Charge.

How does the application distinguish between qualifying and non qualifying CCP?

Application expects the user to identify the CCP as qualifying and non-qualifying. Application expects this information as counterparty information. For collateral posted with non-qualifying CCP the application expects other inputs for calculating RWA like, collateral type, pd, lgd, and maturity. Also counterparty type is assumed to be Central Counterparty for the calculation.

Why do application expects the role of the reporting bank with CCP for each transaction?

As per the example in BIS, a CCP also plays a role of Clearing Member for reporting bank transaction with another CCP. This case makes it difficult for the risk system to capture the role of reporting bank at party level and hence is required for each transaction.

14   Glossary

AIRB	Advanced Internal Rating Based
AMA	Advanced Measurement Approach
ASCII	American Standard Code for Information Interchange
BCBS	Basel Committee on Banking Supervision
Bankruptcy Remote	In case of liquidation of the company, if the collateral is bankrutcy remote then legal proceeding will not have the right to liquidate the collateral.
BIS	Bank of International Settlements
CAR	Capital Adequacy Ratio
Central Counterparty (CCP)	Central Counterparty (CCP) is a clearing house that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the future performance of open contracts.
CCB	Capital Conservation Buffer
CCF	Credit Conversion Factor
CCR	Counterparty Credit Risk
CET1 Ratio	Common Equity Tier 1 Ratio
Clearing Member (CM)	Clearing Member (CM) is a member of, or a direct participant in, a CCP that is entitled to enter into a transaction with the CCP, regardless of whether it enters into trades with a CCP for its own hedging, investment or Capitalization of exposures to central counterparties.
Clearing Member Client (CMC)	Clearing Member Client (CMC) is the client of the Clearing Member and trades are done through clearing member for the client.

CRE	Commercial Real Estate
CRM	Credit Risk Mitigants
CVA	Credit Valuation Adjustment
DeFQ	Data entry and Forms Queries
EAD	Exposure At Default
FFIEC	Federal Financial Institutions Examination Council
FIRB	Foundation Internal Rating Based
FTP	File Transfer Protocol
GL	General Ledger
GRC	General Risk Charge
GUI	Graphic User Interface
IAA	Internal Assessment Approach
IFSB	Islamic Financial Services Board
IMA	Internal Models Approach
IMM	Internal Model Method
IR	Interest Rate
IRB	Internal Rating Based
LGD	Loss Given Default
LIBOR	London Inter Bank Offered Rate
OBIEE	Oracle Business Intelligence Enterprise Edition
OFSAA	Oracle Financial Services Analytical Application
OFSAAI	Oracle Financial Services Analytical Application Infrastructure
OTC	Over the Counter

Non Securitization Exposure	The exposures that are not securitized by the bank which include, loans, investments, Bonds, Facilities Purchase Receivables and so on are known as Non Securitized Exposures.
PD	Probability of Default
Private Sector Credit Exposure	A private sector credit exposure is defined as an exposure to a company or an individual that is included in credit risk-weighted assets (excluding an exposure to a sovereign, the Bank for International Settlements, the European Central Bank, the European Commission, the International Monetary Fund, a multilateral development bank (MDB), a public sector entity (PSE), or a government sponsored entity (GSE). The geographic location of a private sector credit exposure is the national jurisdiction of the place the borrower is located in.
Qualifying Central Counterparty (QCCP)	A qualifying central counterparty (QCCP) is an entity that is licensed to operate as a CCP (including a license granted by way of confirming an exemption), and is permitted by the appropriate regulator/overseer to operate as such with respect to the products offered.
	This is subject to the provision that the CCP is based and prudentially supervised in a jurisdiction where the relevant regulator/overseer has established, and publicly indicated that it applies to the CCP on an ongoing basis, domestic rules and regulations that are consistent with the CPSS-IOSCO Principles for Financial Market Infrastructures.
RBA	Ratings Based Approach
RBI	Reserve Bank of India
RDBMS	Relational Database Management System
Regulatory Reporting	This is a jurisdiction specific requirement. These reporting requirements are over and

	above the Pillar III reporting requirements and to be submitted to respective regulators.
RRE	Residential Real Estate
RWA	Risk-weighted Assets
SCD	Slowly Changing Dimension
SFA	Supervisory Formula Approach
SFT	Securities Financing Transactions
SRWA	Simple Risk Weight Approach
TXN	Transaction
SLR	Statutory Liquidity Ratio
Stress Testing	Process of defining shocks, stress scenarios and specifying a standalone execution of stress scenarios to obtain the stress values of the variables or mapping a scenario to a Baseline Run
T2T	Table to Table
VaR	Value at Risk

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